12,823

OFFICE OF THE CHIEF CONSERVATOR
3 - JUN 1955

WORKING PLAN

FOR

THE VELLORE EAST FOREST DIVISION

1949-50 TO 1963-64

BY

SRI N. RAMAKRISHNAN,
Assistant Conservator of Forests

Under the direction of the Conservator of Forests
Working Plans Circle

PRINTED BY THE SUPERINTENDENT
GOVERNMENT PRESS
MADRAS
1955

OFFICE OF THE CHIEF CONSERVATOR OF FORESTS
3 - JUN 1955
MADRAS-5

INTRODUCTION.

The last working plan dealing with the forests of Vellore East division was drawn up by Mr. A. R. Brand and was sanctioned in the proceedings of the Chief Conservator of Forests No. 211, Press, dated 13th April 1938. The period of this plan was from 1936–37 to 1945–46.

The following revised plan brings under working areas hitherto not worked in order to meet the increased demand which now exists. It replaces the "Rab" method of artificial regeneration by means of the "kumri" method where "kumridars" are readily forthcoming and only in selected and good pockets of soil, discontinues the Palar river edge casuarina plantations according to the scheme prepared by Mr. Roland Mitchell, M.B.E., and prescribes the re-introduction of Pithacolobium dulce a species which had grown previously quite successfully and still holds out good promise of growing and supplementing it with *Prosopis juliflora* which has been recently tried and whose suitability to the soil conditions is still not fully known.

So far as the Sandalwood Working Circle is concerned, the revised plan puts a stop to the spike control measures by lopping branches of sandal trees which have not manifested the disease but which were suspected to marking the disease. The lopping method of control has failed. It is believed to adversely affect the general health and well being of a sandal tree and if anything pre-dispose it to spike by impairing the health and vitality of a sandal tree or by disturbing its metabolic equilibrium it must increase its proneness to the disease. By the contrary, it is hoped that trees in a robust state of health with ample green foliage should be able to resist the disease. Hence, the drastic departure from the previous prescriptions.

VELLORE,
Dated 25th August 1948.

N. RAMAKRISHNAN,
Assistant Conservator of Forests and Working Plan Officer.

12823

Forest Central Library, Chennai
12823

TABLE OF CONTENTS

PART I.

Summary of facts on which the proposals are based.

CHAPTER I—THE TRACT DEALT WITH.

SECTION 1—NAME AND SITUATION.

PARAGRAPH		PAGE
1	Name	1
2	Situation	1
3-4	Area	1

SECTION 2—CONFIGURATION OF THE GROUND.

5	Altitude and topography	1
6	The Javadi Hills	1
7	The Kalroyan Hills	1
8	Plains	1
9	Palar river margins	2
10	Drainage	2

SECTION 3—GEOLOGY, ROCK AND SOIL.

11	Sub-soil	2
12	Surface soil	2
13-14	Humus	2

SECTION 4—CLIMATE.

15-16	General	2
17	Winds	2
18-19	Rainfall	2-4
20	Malaria	4

SECTION 5—WATER-SUPPLY.

21-24	Water-supply	4

SECTION 6—DISTRIBUTION OF THE AREA.

25-27	Distribution of the area	4-5

SECTION 7—STATE OF BOUNDARIES.

28	General	5
29-31	Enclosure boundaries on the Javadis	5

SECTION 8—LEGAL POSITION.

32	Reserves	6-9
33	Unreserves	10
34	Panchayat reserves	10
35	Position of sandal on patta lands	10
36-37	Land revenue administration in the Javadi Hill villages of the Polur and Santavasal ranges	10

SECTION 9—RIGHTS AND CONCESSIONS.

38	Granted at settlement	10
39	Granted subsequent to settlement	10-11
40	Enclosures	11-12
41	Land leases	12-14

CHAPTER II—THE FOREST.

SECTION 1—COMPOSITION AND CONDITION OF THE CROP.

PARAGRAPH			PAGE
42	General		14
43	The Javadis		14
44	Do.	Sandal	14
45–48	Do.	Bamboo	15
49	Do.	Flowering and dying of bamboos	15
50	Do.	Other species	15
51	Do.	Undergrowth	15
52	Do.	Prickly pear (Opuntia dillenii)	15
53	Do.	Lantana	15
54–55	The Kalroyan Hills		15–16
56–57	Plains Forests		16
58	Do.	Sandal	16
59	Do.	Teak, *Pterocarpus marsupium* and Rose Wood	16
60	Do.	Tamarind	16
61	Do.	Bamboo	16
62	Do.	Prickly-pear (Opuntia dillenii)	16
63	Do.	Lantana	16
64–65	Palar-River Plantations		16–17
66	Do.	Red sanders	17
67	Do.	Cassia Siamia	17
68	Do.	Sandal	17
69	Do.	Undergrowth	17
70	Do.	Prickly-pear (Opuntia dillenii)	17
71	Botanical list		17

SECTION 2—INJURIES TO WHICH THE CROP IS LIABLE.

72–73	General	17
74–75	Fire	18
76–78	Theft	18
79–80	Lopping and hacking	18
81–82	Bark stripping	18–19
83	Animals	19
84–85	Grazing	19
86	Climatic	19
87–88	Injurious plants	19
89	‘ Spike ’ disease in sandal	19

CHAPTER III—UTILIZATION OF THE PRODUCE.

SECTION 1—AGRICULTURAL WANTS AND CUSTOMS OF THE PEOPLE.

90	The population		19
91	Wants of the population		20
92–93	Do.	Fuel and small timber	20
94	Do.	Bamboos	20
95	Do.	Green leaf manure	20
96	Do.	Thatch, fodder and broom grass	20
97	Do	Grazing	20

SECTION 2—MARKETS AND MARKETABLE PRODUCTS.

98	Marketable products		20
99	Do.	Sandalwood	20
100	Do.	Bamboos	20–22
101	Do.	Minor forest produce	22
102–103	Markets		22–23

SECTION 3—LINES OF EXPORT.

104	Railways	23
105	Trunk roads	23
106	Other metalled roads	23
107–108	Forest roads	23

SECTION 4—METHODS OF EXPLOITATION AND THEIR COST.

PARAGRAPH		PAGE
109	Sandalwood	24
110	Bamboos	24
111	Fuel	24
112	Charcoal	24
113	Green leaf manure	24–25
114–115	Minor forest produce	25
116	Thatch, fodder and broom grass	25
117	Removal of hay by the Military Grass Farms	25–26
118–121	Grazing	26

SECTION 5—PAST AND CURRENT PRICES.

122	General	26
123	Sandalwood	27
124	Bamboos	28–29
125	Fuel	30–33
126	Minor forest produce	34–35

CHAPTER IV—STAFF AND LABOUR SUPPLY.

127	Staff, administrative, executive and protective	36
128	Staff, clerical	36
129–130	Labour supply	36

CHAPTER V—PAST SYSTEMS OF MANAGEMENT.

SECTION 1—GENERAL HISTORY OF THE FOREST.

131	Introduction	36
132–135	Period prior to the passing of the Madras Forest Act in 1882	36–37
136	Period subsequent to the passing of the Madras Forest Act in 1882	37
137–142	Administrative changes	37–38
143–144	Working Plans	38–39

SECTION 2—PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS.

145	Sandal, prior to Mr. C. C. Wilson's plan	39
146	Sandal, Mr. C. C. Wilson's plan	39
147	Do. Method of treatment and subdivision of the area	39–41
148	Do. Fellings	41
149	Do. Extraction	41
150–152	Do. Tending	41–42
153	Do. Specially protected blocks	42
154	Do. Regeneration	42
155	Do. Regeneration cleaning	42
156–157	Do. Regeneration—Sowing in blanks and the more important results achieved	42–44
158	Sandal, Mr. A. R. Brand's plan	44
	(a) Do. Constitution and subdivision of the area	44
	(b) Do. Fellings	44
	(c) Do. Yield	44–45
	(d) Do. Tending	45
	(e) Do. Fire-protection	45
	(f) Do. Spike disease	45–46
159–166	Timber	46
167–176	Bamboos—Prior to Mr. Brand's Working Plan	47–49
177	Bamboos—Mr. Brand's Working Plan	49
	(a) Do. General constitution and area	49
	(b) Do. Flowering	49
	(c) Do. Period of lease	50
	(d) Do. Grazing	50
	(e) Do. Fire-protection	50
178–185	Fuel—Earlier plans	50–51
186	Do. The Palar river plantations	51
187–192	Do. Prior to Mr. Brand's Working Plan—Method of treatment and subdivision of the area	51–53
193	Do. Prior to Mr. Brand's plan—Clearing	53
194–195	Do. do. Artificial regeneration	53
196–197	Do. do. Cutting minor forest produce yielding trees and thorny growth at time of felling	53
198	Do. do. Closure to grazing	54
199	Do. do. Indicator areas	54

PARAGRAPH		PAGE
200	Fuel—Result of working prior to Mr. Brand's plan—Fellings	54
201	Do. do. —Cleaning	54
202	Do. do. Artificial regeneration and rab sowings.	54–55
203	Do. Mr. Brand's plan	56
(a)	Do. do. General constitution and area and subdivision	56
(b)	Do. do. Size and allocation of coupe	56
(c)	Do. do. Yield	56
(d)	Do. do. Regulation of fellings, etc.	56
(e)	Do. do. Agency of felling	56
(f)	Do. do. Other regulations	56
(g)	Do. do. Closure to grazing	56
(h)	Do. do. Results of working during the currency of Mr. Brand's plan.	56–58
204–209	Minor Forest Produce—Prior to Mr. Brand's plan	58–59
210	Do. Mr. K. R. Venkataramana Ayyar's plan	59
211	Do. Mr. Gaudoin's plan	59–60
212	Do. Odugathur Range	60
213	Do. Palar river plantations	60
214	Do. Results of past working	60
214-A	Do. Mr. Brand's plan	60

SECTION 3—FIRE PROTECTION.

215	Special and general protection and early burning	60–61
216	Results of fire protection	61
217	Costs and rewards	61–62
218	Mr. Brand's Working Plan	62

SECTION 4—SPECIAL WORKS OF IMPROVEMENTS UNDERTAKEN.

219	Roads	63
220	Buildings	63–64
221	Wells	65

SECTION 5—PAST YIELDS.

222	Sandalwood	66
223	Bamboos	67
224	Fuel and small timber	67–69
225	Minor forest produce	70–71

SECTION 6—PAST REVENUE AND EXPENDITURE.

226	Past revenue and expenditure	72

CHAPTER VI—STATISTICS OF GROWTH AND YIELD.

SECTION 1—SANDAL.

227	Growing stock	72–73
228	Yield of heartwood per tree	73
229	Ratio of diameter to yield of heartwood	73
230	Yield of heartwood per acre	73
231	Mortality in sandal	73–74

SECTION 2—FUEL SPECIES.

232–233	Rotation	74

PART II.

Future management discussed and prescribed.

CHAPTER I—BASIS OF PROPOSALS.

SECTION 1—GENERAL OBJECTS OF MANAGEMENT.

234–235	The objects of management	75

SECTION 2—METHODS OF TREATMENT TO BE ADOPTED.

236 (i)	Sandal	75
(ii)	Fuel and small timber	75
(iii)	Bamboos	75
(iv)	Minor forest produce	75
(v)	Green leaf manure	75
(vi)	Grazing	75

SECTION 3—WORKING CIRCLES, THEIR AREA AND DISTRIBUTION—REASONS FOR THEIR CONSTITUTION.

PARAGRAPH		PAGE
237	Working Circles	75

SECTION 4—PERIOD OF WORKING PLAN AND THE NEXT REVISION.

238	The period covered by this plan	75
239	The next revision	75

CHAPTER II—WORKING PLAN FOR THE SANDAL WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE, AREA AND CHARACTER OF THE VEGETATION.

240	General constitution and area	76
241–243	Character of the vegetation	76

SECTION 2—ANALYSIS AND VALUATION OF THE CROP.

244–245	Sample plot enumeration	76–78
246	Sandal in enclosures	78

SECTION 3—METHOD OF TREATMENT.

247–248	Silvicultural system	78
249–250	Division of the area into felling series	78
251	Felling cycle	78
252	Allocation of coupes	78
253	Calculation of the yield	79

SECTION 4—METHOD OF EXECUTING FELLINGS.

254	Regulation of operations	79
255	Clearing coupe boundaries	79–80
256	Exploitation	80
257	Minimum exploitable size	80
258	Restriction of output	80

SECTION 5—TABULAR STATEMENT OF FELLINGS TO BE MADE.

259	Coupes	81
260	Enclosures	82–83

SECTION 6—SUBSIDIARY SILVICULTURAL REGULATIONS.

261	Tending	83
262	Artificial regeneration of sandal	83
263	Selection of site	83
264	Size and number of propagation plots	83
265	Demarcation	83
266	Preparation of the area	84
267	Staking	84
268	Planting	84
269	Replacement of casualties	84
270	Fencing	84
271	Watering	84
272	Weeding and tending	84
273	Control	84
274	Localities proposed for formation of propagation centres	84
275	Seed and seed supply	84
276	Nursery	84
277	Selection of site and formation of beds	84–85
278	Pre-treatment of seeds	85
279	Sowing	85
280	Maintenance	85

SECTION 7—OTHER REGULATIONS.

281–282	Fire protection	85
283	Measures for prevention of the spread of 'spike' disease	85
284–287	Retail sales	85–86

CHAPTER III—WORKING PLAN FOR THE FUEL AND SMALL TIMBER WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE, AREA AND CHARACTER OF THE VEGETATION.

288	General constitution and area	86
289	Character of the vegetation	86

SECTION 2—METHOD OF TREATMENT.

PARAGRAPH		PAGE
290	Silvicultural system	86
291	Division of the area into felling series	86-88
292	Rotation	88
293	Size and allocation of coupes	88
294-296	The Palar Plantations	89
297	Calculation of the yield	90-93

SECTION 3—METHOD OF EXECUTING THE FELLINGS.

298	Regulation of operations	94
299	Method of executing the fellings	94
300	Laying out and demarcation of coupes	94
301	Cost of demarcation	94
302	Agency of felling	94
303	Period of lease	94
304	Coupe arrears	94
305	Division of coupes into strips and control of fellings	94
306	Green leaf manure	94
307	Cutting thorny growth at the time of felling	95
308	Useless tree species	95
309	Felling rules	95
310	Disposal of felled material	95

SECTION 4—TABULAR STATEMENT OF FELLINGS.

311	Tabular statement of fellings	95

SECTION 5—SUBSIDIARY SILVICULTURAL REGULATIONS.

312	Artificial regeneration (The Palar Plantations)	95
313	Method of treatment—Silvicultural system	96
314	Rotation	96
315	Preparation of the ground	96
316	Mode of regeneration—Species to be used—Prosopis juliflora	96
317	Mode of regeneration—Inga dulce	96
318	Concentrated 'Kumri' regeneration—Introduction	96
319	Object	96
320	Area kumried and extent of area available	97
321	Method of regeneration	97
322	Allocation of areas amongst Kumridars	97
323-324	Issue of permits under section 21 of the Madras Forest Act	97
325	General details of the method	97
326	Soil working and lay out	97
327	Bunding	98
328	Seed collection	98
329	Sowing	98
330	Field crops	98
331	Forest crops	98
332	Soil working	99
333	Later tending	99
334	Climber and creeper cutting	99

SECTION 6—OTHER REGULATIONS.

335	Supply of small timber to ryots for the manufacture of agricultural implements	99
336	Disposal of palmyra palms in the two plantation felling series	99
337	Indicator areas	99
338-339	Closure to grazing	99
340	Coupe stones	99

CHAPTER IV—WORKING PLAN FOR THE BAMBOO WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE, AREA AND CHARATER OF THE VEGETATION.

341-342	General constitution and area	99-100
343	Character of the vegetation	100
344	Flowering and dying of bamboos	100
345	Damages to *Dendrocalamus strictus*	100

SECTION 2—METHOD OF TREATMENT.

PARAGRAPH		PAGE
346	General	100
347	Felling cycle	100
348	The intensity of fellings in a clump	100
349	The height at which culms should be felled	100
350	Felling rules	101
351	Calculation of the yield	101

SECTION 3—METHOD OF EXECUTING THE FELLINGS.

352	Subdivision of the area	101–103
353	Regulation of fellings	103
354	Period of lease	104

SECTION 4—TABULAR STATEMENT OF FELLINGS.

355	Tabular statement of fellings	104

SECTION 5—OTHER REGULATIONS.

356	Hacking of *Dendrocalamus strictus*	105
357	Overworking by contractors	105
358–359	Construction of new roads and extraction cart-tracks	105
360	Grazing	105
361–362	Fire protection	105

CHAPTER V—WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE AREA.

363	General constitution	105
364–365	Subdivision of the area with reference to the various kinds of produce	105–106

SECTION 2—METHOD OF TREATMENT.

366	Konnai bark (*Cassia fistula*)	107
367	Avaram bark (*Cassia auriculata*)	107
368	Sural bark (*Ventilago spp.*)	107
369	Quarries	107
370	Other produce	107
371	Departmental working	107
372	Malayalee labour	107

SECTION 3—IMPROVEMENT OF MINOR FOREST PRODUCE SPECIES.

373	Object of management	107
374	Selection of area	107
375	Demarcation	107
376	Selection of kumridars	107
377–378	Issue of permits under section 21 of Madras Forest Act	108
379	Clearing	108
380	Lay out	108
381	Choice of species and sowing	108
382	Weeding and soil working	108
383	Watering	108
384	General	108

CHAPTER VI—WORKING PLAN FOR THE GREEN LEAF MANURE WORKING CIRCLE.

SECTION 1—INTRODUCTION.

385–386	Introduction	108–109
387	Demand	109

SECTION 2—AREA AND CONSTITUTION OF THE CIRCLE.

388	Area and constitution	109–110

SECTION 3—METHOD OF TREATMENT.

389	System	110
390	Rules regulating cutting and removal	110

SECTION 4—ARTIFICIAL REGENERATION OF MANURE LEAF SPECIES.

PARAGRAPH		PAGE
391	Object of management	110
392–393	Division of felling series	110
394	The period of cultivation	110
395	Felling cycle	110
396	Kumridars required	111
397	Method of treatment	111
398	Selection of kumridars	111
399–400	Issue of permits under section 21 of Madras Forest Act	111
401	Sowing	111
402	Soil working	111
403	Grazing	111
404	Protection	111
405	Financial forecast	111

CHAPTER VII—WORKING PLAN FOR THE GRAZING WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE CIRCLE.

406	Constitution	111

SECTION 2—METHOD OF TREATMENT.

407–408	Introduction	112
409	Prescriptions	112

SECTION 3—AREAS WHERE NO GRAZING CONCESSIONS EXIST.

410–411	Issue of permits	112

SECTION 4—GRAZING CONCESSIONS.

412	Concessions	112
413	Concessions: free grazing under the 'Forest Village System'—Terms of concession	112
414	Do. free grazing under the 'Forest Village System'—Grazing blocks	112–114
415	Do. free grazing under the 'Forest Village System'—Refund of grazing fees.	115
416	Do. free grazing under the 'Forest Village System'—Thellai reserve	115
417	Do. grazing on payment of half the usual fees—Terms of concessions	115

SECTION 5—SUBSIDIARY MEASURES FOR IMPROVEMENT.

418	Closure of burnt areas	115
419	Improvement of watering facilities	115–116

SECTION 6—CUTTING AND REMOVAL OF GRASS FROM RESERVED FORESTS.

420	Cutting and removal of grass from Reserved Forests under the control of the Forest Department	116
421	Fodder supply from forest areas	116

SECTION 7—OTHER REGULATIONS.

422	Demarcation of closed areas	117

SECTION 8—ROTATIONAL GRAZING.

423	Rotational grazing	117

CHAPTER VIII—MISCELLANEOUS REGULATIONS.

SECTION 1—FIRE PROTECTION.

424	General	117
425	Prescriptions	117
426	Special protection: Areas in which undertaken and their subdivision	117
427	Do. Fire lines	117–118
428	Do. Fire rewards	118
429	Do. Fines for bad protection	118
430	Do. Payment of rewards	118–119
431	General protection: Areas in which undertaken	119
432	Do. Fire tracing important roads, cart-tracks and foot-paths	119

SECTION 2—EXPERIMENTS.

433	Red sanders (Pterocarpus santalinus) increment plot	119

SECTION 3—ROADS, BUILDINGS AND WELLS.

PARAGRAPH		PAGE
434	Existing roads	119
435	Proposed roads	119–120
436	Metalling existing roads	120
437	Existing buildings	120
438	Proposed buildings	120–121
439	Wells	121

SECTION 4—MISCELLANEOUS REGULATIONS.

440	Eradication of lantana	121–122
441	Do. spraying	122

SECTION 5—EXPERIMENTAL PLANTATIONS OF SOFTWOOD SPECIES.

442	Object of management	122
443	Division of felling series	122
444	Rotation	122
445	Method of treatment—Demarcation	122
446	Clearing	122
447	Aligning and staking	122
448	Espacement	122
449	Choice of species	122
450	Planting	122
451	Weeding	123
452	Protection	123
453	Nursery	123
454	General	123

SECTION 6—EXISTING PLANTATIONS AT AMERDI AND TIRUVANNAMALAI.

455	Amerdi timber plantation	123
456	Do. casuarina plantation	124
457	Do. *Melia dubia* plot	124
458	Tiruvannamalai casuarina plantation	124

SECTION 7—MALARIA.

459	Malaria	125

SECTION 8—BOUNDARIES.

460	Reserve boundaries	125
461	Enclosure boundaries	125

SECTION 9—CONTROL.

462	General	125
463	Sandal working circle	125
464	Fuel and small timber working circle	125 126
465	Bamboo working circle	126
466	Minor forest produce working circle	126
467	Green leaf manure working circle	126
468	Grazing working circle	126
469	The whole working plan area	126–127

CHAPTER IX—ESTABLISHMENT AND LABOUR.

SECTION 1—ESTABLISHMENT.

470	Additional establishment required	127

SECTION 2—LABOUR.

471	Labour	127

CHAPTER X—FINANCIAL FORECAST AND COST OF THE WORKING PLAN.

472	Financial forecast	127–129
473	Cost of the working plan	130

SUMMARY OF PRESCRIPTIONS.

	Summary of prescriptions	130–136

APPENDICES

APPENDIX		PAGE
I	List of revenue taluks comprising the Vellore East Forest Division	136
II	Statement of monthly rainfall recorded at each rain gauge station during the period 1935–46	137–138
III	List of reserves transferred to Panchayat control	138–139
IV	G.O. No. 1462, Revenue, dated 10th June 1907	139–140
V	Agreement executed by pattadar (for protection of sandalwood)	140
VI-A	Botanical list (alphabetically by natural orders)	140–144
VI-B	Botanical list (alphabetically by Tamil names)	144–147
VI-C	Spike disease of sandal	148
VII	Statement of grazing incidence	149
VIII	Control forms—	
	Sandal Working Circle—	
	Control of fellings, Form VIII	150
	Record of yield, Form VIII (*a*)	150
	Felling series Journal, Form IX	150
	Sandal Propagation Control Journal, Form IX (*a*)	150
	Fuel Working Circle—	
	Control of fellings, Form XI	151
	Record of yield, Form XI(*a*)	151
	Control of concentrated 'Kumri' regeneration, Form XII	151
	Control of Palar Plantation Fuel Felling Series, Form XII (*a*)	151
	Bamboo Working Circle—	
	Control of fellings, Form XIII	152
	Record of yield, Form XIII (*a*)	152
	Minor Forest Produce Working Circle—	
	Control of working, Form XIV	152
	Record of yield, Form XIV (*a*)	152
	Green Leaf Manure Working Circle—	
	Record of yield, Form XV (*a*)	152
	Grazing Working Circle—	
	Control of grazing, Form XVI	153
	Record of works	153
	Control journal	153
	Deviation statement	154

WORKING PLAN FOR THE VELLORE EAST FOREST DIVISION.

PART I

Summary of facts on which the proposals are based.

CHAPTER I—THE TRACT DEALT WITH.

SECTION 1—NAME AND SITUATION.

Name.—This working plan deals with the reserved forests of the Vellore East Forest Division, which are still under the control of the Forest department, and will be known as the Vellore East Working Plan.

2. *Situation.*—The Vellore East Forest Division was constituted a separate unit in December 1932 as a result of the bifurcation of the then Vellore Forest Division. The tract falls between latitudes N. 11° 59′ and 13° 2′ and longitudes E. 78° 39′ and 80° 20′. It extends along the east coast from Kottalaiyar river in the north to the Ponniar river in the south, and inland as far as Vaniyambadi on the Southern Railway.

3. *Area.*—The division is 3,393 square miles in extent and comprises of 11 revenue taluks, a list of which is given in Appendix I.

4. The area of the reserved forests still under Forest department control is 486 square miles. These reserves are situated along the western boundary of the division and are for the most part adjacent to the forests of the neighbouring Vellore West Division. Details relating to these areas and distribution are given in paragraphs 25 and 32 below.

SECTION 2—CONFIGURATION OF THE GROUND.

5. *Altitude and topography.*—The tract shows great variation in altitude and configuration. For the purpose of description it may be classified under three heads, viz., The Javadi and Kalroyan hills, the plains and the Palar river margins.

6. *The Javadi Hills.*—These hills monopolize by far the greater part of the area and run approximately north and south between the Vellore-Bangalore and Vellore-Cuddalore roads. They attain a maximum length of about 40 miles and a maximum width of about 16 miles. The outer slopes are steep, rocky and often precipitous. The centre and south of the range, also extending into the neighbouring Vellore West Division, consist of extensive andulating plateaux with large valleys cutting across them and interspersed by occasional peaks. In the north the ground is broken up into a series of hills and valleys, a few small plateaux occurring on the hill tops. The average height above mean sea level is approximately 2,500 feet. The highest point in the Vellore East Division is Puliyankuppam Malai, 3,535 feet, in the Santavasal Range.

7. *The Kalroyan Hills.*—Similar in formation to the Javadis, the Kalroyans form a small isolated range about 14 miles long and 6 miles wide in the extreme south of the division. The average height above mean sea level is approximately 2,000 feet. The highest point, Valasamalai, 3,395 feet, marks the summit of a plateaux some 1,500 acres in extent.

8. *Plains.*—These comprise the more or less flat stretches extending from the foot of the hills to the limits of the cultivation and other private holdings in the Valleys and low-lying country. The height above mean sea level varies from 750 feet in the south of the division to 1,250 feet in the north.

9. *Palar river margins.*—Only 135,125 acres of river margin fall within the scope of this plan. The area comprises seven plantations situated on the flat sandy banks of the Palar river. The elevation above mean sea level varies from about 540 feet to 780 feet.

10. *Drainage.*—The country slopes mainly from west to east and is drained by the Palar river in the north and the Ponniar in the south. Rivers of secondary importance are the Punniyathirtha Nadi, flowing into the Palar near Pallikonda, and the Cheyyar near Polur with its feeders the Thellai and the Padavettar.

SECTION 3—GEOLOGY, ROCK AND SOIL.

11. *Sub-soil.*—The underlying rock is mostly granite gneiss in various stages of disintegration, with frequent, sometimes extensive, outcrops of granite.

12. *Surface soil.*—The soil varies from a hard and stony type on the hill sides, where disintegrated quartz predominates, to a fertile red clayey loam on the plateaux and in the valleys. In the former case little or no forest growth exists, while in the latter, the depth of soil is capable of supporting reasonably good tree growth.

13. *Humus.*—The soil is strikingly devoid of humus. The little leaf mould which is formed each year crumbles into powder in the dry season and, owing to the steepness of the country, a usually very open canopy and the scarcity, and often complete absence, of protective undergrowth is carried away by the pre-monsoon showers in April and May.

14. Remains of experimental excavations and borings for pyrites are to be found in the Periamalai reserve of the Polur Range, where an area of 3·53 square miles was leased for a period of one year from the 2nd of March 1928, for the purpose of prospecting. The experiment seems to have been a failure.

SECTION 4—CLIMATE.

15. *General.*—The climate of the Javadis is particularly favourable to the growth of sandalwood, combining as it does comparative coolness with plenty of sunshine and a very fair rainfall, the latter however never being sufficient to set up waterlogged condition of the soil, so unfavourable for the development of this species. The Kalroyan hills enjoy a similar climate.

16. The plains and the foot of the hills are hot and dry. During the months of November, December and January the weather becomes pleasant but never cold.

17. *Winds.*—The division is subject to the usual monsoon winds, but these are generally not strong enough to cause damage to forest growth.

18. *Rainfall.*—There are nine rain gauge stations in the division ; one at Tanipadi of Tiruvannamalai Range and two at Tiruvalam and Virinchipuram of Vellore Range having been newly installed during the years 1942 and 1943 respectively due to the formation of Casuarina plantations in these localities. The average monthly rainfall recorded at each station over a period of twelve years, 1935 to 1946 for all the stations except the three stations mentioned above, is given in the following statement.

Statement showing the average monthly rainfall at each main gauge station—Vellore East Division

Name of station.	Average rainfall in inches. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Remarks.
I. Vellore Range.														
1 Tiruvalam	0·11	5·00	0·46	5·30	0·81	1·32	2·12	8·10	6·40	9·59	5·33	11·93	56·47	1943–46. Installed during 1943; average for four years only.
2 Virinchipuram ..	2·75	..	0·60	0·38	1·40	0·95	1·90	3·89	4·10	10·95	6·75	4·16	37·83	
II. Odugathur Range.														
3 Naickaneri	0·40	0·13	0·33	0·99	3·23	1·04	1·40	3·49	5·46	5·26	4·87	2·90	29·50	1935–46.
III. Santhavasal Range.														
4 Shenbagatope ..	0·87	0·18	1·00	1·25	2·52	2·43	0·95	4·74	5·10	7·40	8·24	4·55	39·23	
5 Amerdi	1·59	0·73	0·69	1·60	4·23	2·42	2·21	4·30	6·55	9·51	7·82	4·42	46·07	
IV. Polur Range.														
6 Moolakad	0·34	0·13	1·53	0·98	2·48	0·59	1·08	4·34	5·84	8·79	5·84	2·37	34·31	
7 Patrakad	0·96	0·67	1·27	2·56	4·50	1·67	1·55	6·10	6·28	11·96	10·82	5·22	53·56	
8 Komattiyur ..	0·57	0·70	0·78	2·12	4·63	2·12	2·10	5·53	6·82	7·23	7·73	3·83	44·16	
V. Tiruvannamalai Range.														
9 Tanipadi	1·12	..	0·32	1·40	2·66	0·76	8·80	6·24	6·30	8·58	9·66	4·58	50·42	1942–46. Installed during 1942.
Total ..	8·71	7·54	6·98	16·58	26·46	13·30	22·11	46·73	52·85	79·27	67·06	43·96	391·55	
Average for the division.	0·97	0·84	0·77	1·84	2·92	1·48	2·46	5·19	5·87	8·81	7·45	4·89	43·51	

19. It will be seen from the foregoing statement that the division gets the benefit of both the north-east and south-west monsoons and that the rainfall is distributed throughout the year, the heaviest falls occurring during the latter half of the year, especially in the months of October and November. The figures should, however, be treated with caution as they are recorded by forest guards and may not be accurate. The monthly rainfall statements for each year during the period 1935 to 1946 are to be found in Appendix II.

20. *Malaria.*—The forests of the division have an evil reputation for malaria particularly during the first half of the year. The camps on the Javadis plateau are worse than others. There is in some quarters a feeling that this reputation is exaggerated, but judging by the health of the subordinates employed on enumeration and stock-mapping in connection with this plan, it would seem that it is fully justified.

SECTION 5—WATER-SUPPLY.

21. Water-supply to all subordinate quarters and rest-houses is entirely from wells and is generally satisfactory. The usual sources of supply to the villages in the enclosures are tanks and wells. The rivers and streams, with the exception of the Ponniar in the south of the division, carry water only for a few days after rain has fallen.

22. In addition to a well, Amerdi, in the Santavasal range, also has a plentiful supply of spring water rising in several places along the banks of the Amerdi river.

23. Tube wells were put in at Komettiyur and Mandaparai in 1919 at a cost of Rs. 1,400 and Rs. 1,340 respectively. They were intended to supply the forest rest-houses at these two places, but also to supplement supply from ordinary wells in the neighbouring villages. The Komattiyur tube-well is functioning satisfactorily, while that at Mandaparai broke down some years ago and has not yet been set right. This needs immediate attention.

24. The question of water facilities in grazing grounds needed attention at the time of the writing up of Mr. Brand's working plan and so he suggested improvements to about 35 wells and tanks. Some of these wells and tanks have been repaired and the rest are still to be repaired.

SECTION 6—DISTRIBUTION OF THE AREA.

25. The headquarters of the division is Vellore. The 485·7 square miles of reserved forest is distributed among the five ranges as follows :—

Range.	Headquarters.	Area of reserves in square miles.
Vellore	Vellore	62·62
Odugathur	Odugathur	110·24
Santavasal	Santavasal	123·05
Polur	Polur	107·24
Tiruvannamalai	Tiruvannamalai	82·55
		485·70

The present area of each reserve is given in column 12 of the statement at paragraph 32 below.

26. As per G.O. Ms. No. 471, dated 31st August 1936, the Odugathur range was bifurcated into two units, as Vellore range and Odugathur range.

27. The names and areas of the beats into which each range is divided are given in the following statement. Details of headquarters and staff are also shown.

Serial number and name.	*Area in acres.*	*Headquarters.*	*Staff.* Guards.	*Staff.* Watchers.	*Staff.* Foresters.
		Vellore Range.			
1 Eriyur	4,056	Eriyur	1	1	..
2 Anikattu	5,246	Anikattu	1	1	1
3 Athiyoor	7,040	Govindareddipalayam.	1	1	1 at Sholavaram.
4 Thellai	4,154	Kinnikolam	1	1	..
5 Erimodu	6,649	Erimodu	1	1	..
6 Virinchipuram	387	Virinchipuram ..	2	..	1
7 Ammundy	293	Ammundy	2	..	1 at Tirumani.
8 Kilminnal	150	Poottuthaku	2	..	1
9 Tiruvallam	464	Tiruvallam	2	1	..
10 Vannivedu	57	Vannivedu	1	..	..
11 Banavaram	1,021	Banavaram	1	..	..
12 Pinnathorai	5,382	Pinnathorai	1	1	..
13 Kattupathur	5,094	Kattupathur	1	1	..

Serial number and name.	*Area in acres.*	*Headquarters.*	*Staff.* Guards.	Watchers.	Foresters.
		Odugathur Range.			
1 Vellakkal (South) ..	5,292	Vellakkal	1	1	..
2 Vellakkal (North) ..	5,696	Nacharkuppam ..	1	1	..
3 Panangatteri	2,897	Panangatteri ..	1	1	..
4 Ambur	3,865	Ambur	1	1	1
5 Naickaneri	6,650	Naickaneri	1	1	..
6 Thottalam	5,300	Thottalam	1	1	..
7 Pakkam	7,744	Kottakottoy	1	1	..
8 Kallaparai	6,656	Kallaparai	1	1	..
9 Asanampet	4,984	Asanampet	1	1	..
10 Agaram	8,064	Tirumalaikuppam ..	1	1	..
11 Odugathur	5,248	Odugathur	1	1	1
12 Arasampattu	8,300	Kottavoor	1	1	..
		Santavasal Range.			
1 Thongamalai	12,806	Thongamalai	1	1	1
2 Santavasal	4,902	Santavasal	1	1	1
3 Amerdi	17,158	Amerdi	1	1	1
4 Amerdi series		Amerdi	1	..	..
5 Nadanur	23,526	Nadanur	1	2	1
6 Attuparai	6,374	Attuparai	1	1	..
7 Athuvambody	5,771	Athuvambody ..	1	1	..
8 Karnatagiri	7,270	Potharai	1	1	..
9 Vallimalai	2,003	Kesavapuram ..	1	1	..
		Polur Range.			
1 Barghur	6,070	Barghur	1	1	1
2 Komattiyur	11,960	Komattiyur	1	1	1
3 Kovilur	5,580	Kovilur	1	1	..
4 Patrakad	14,373	Patrakad	1	1	1
5 Patrakad (sandal) ..	15,800	Patrakad	1	..	..
6 Mulakad (North) ..	8,190	Gangavaram	1	1	..
7 Mulakad (South) ..	11,210	Mulakad	1	1	..
8 Mulakad (series) ..	15,705	Athimoor	1	..	..
9 Periamalai	6,970	Athimoor	1	1	1
10 Melarasampet	5,113	Melarasampot ..	1	1	..
11 Allialamangalam ..	7,595	Sidduthurai	1	1	..
		Tiruvannamalai Range.			
1 Tandrampet	5,440	Tandrampet	1	1	..
2 Tanipadi	6,592	Tanipadi	1	1	1
3 Reddipalayam	6,048	Reddipalayam ..	1	1	..
4 Veppur	5,090	Malai Munjana Pudur.	1	1	..
5 Bhimarapatti	7,626	Bhimarapatti ..	1	1	..
6 Athipadi	7,194	Athipadi	1	1	..
7 Perunkolathur	6,802	Navakollai	1	1	..
8 Povinjipet	4,314	Pavinjipet	1	1	..
9 Sathanur	4,853	Sathanur	1	1	..

SECTION 7—STATE OF BOUNDARIES.

28. *General.*—The reserve and enclosure, or internal boundaries are demarcated by cleared lines 12 to 18 feet wide. Angles and intermediate points are marked either by whitewashed stone pillars, 4 to 6 feet high, bearing arrow marks and the letters 'R. F' or stone cairns surmounted by granite slabs similarly marked.

29. *Enclosure boundaries on the Javadis.*—The confused state of the enclosure boundaries on the Javadis requires emphasis. In 1888 during the forest settlement of these hills, certain areas within the reserves were excluded from reservation and ordered to be retained as enclosures but were not then demarcated. In 1900 these enclosures were surveyed by the Revenue Survey Department, and it was then found that the area actually cultivated was in excess of that originally set apart for enclosures.

30. In 1907 Government sanctioned the issue of 'ryotwari' pattas for all lands held under 'Sivoyijama' (cultivation without grant of pattas), but not admitted at settlement. In the same year Government also ordered that such areas together with sufficient margin for extension of cultivation and exercise of communal privileges, should be excluded from the reserves and disafforested. Accordingly in 1913 an area of about 40 square miles was disafforested. In 1946 two panchayat forests of 15 square miles in extent have been transferred to the Forest department. The distribution of this area in the various reserves is to be found in column (6) of the statement in paragraph 32 below.

31. Mention has been made by Mr. Brand about the confused state of boundaries of enclosures on the Javadi Hills. The Special Officer, who investigated the state of boundaries of enclosures on the Javadis, reported of encroachments in several places into the reserved forests by the Malaiyalee cultivators. Of these encroachments 52·17 acres were found to have been assigned already on patta to the Malaiyalees though the area was not formally disreserved. This irregularity was set right by disreserving 52·17 acres in Veerappanur Reserved Forest from 1st January 1940—vide page 1639–1640 of Part I of the *Fort St. George Gazette,* dated 19th December 1939. In the other encroached areas the Malaiyalees were allowed to cultivate under the system of annual leases. The number of such leases were 68. This explains the increase in the number of leases in the division from 14 at the time of Mr. Brand's writing his working plan to 82 which is current at present.

SECTION 8—LEGAL POSITION.

32. *Reserves.*—The reserved forests of the division are the absolute property of the State. The numbers and dates of the section 16 notifications relating to the various reserves are given in the following statement, which also shows the disafforestations and panchayat forests resumed as reserves :—

Statement of reserves, Vellore East Division.

Serial number. (1)	Reserve. (2)	Original Settlement. Area in acres. (3)	No. (4)	Date. (5)	Disafforestation. Area in acres. (6)	No. (7)	Date. (8)	Transferred elsewhere. Area in acres. (9)	No. (10)	Date. (11)	Present area in acres. (12)	Remarks. (13)
	(1) *Vellore Range.*											
1	Arasampattu (part).	30,714·00	366	14th July 1893 ..	3,048·62	G.O. 1370	10th May 1913 ..	..	..	....	..	Enclosure Nos. 1 to 7, 9 to 16 and 41 and 42.
		9·44	184	19th June 1922 ..	..	..	....	4,414·00	345	16th July 1915 ..	..	Transferred to Santavasal Range.
								4,527·00	G.O. 1444	18th April 1918.	..	Do.
								1,848·00	Do.	Do.	..	Transferred to Polur Range.
		4,056·00	..	....	..	..	....	..	..	....	..	Transferred from Santavasal Range.
2	Arasampattu Extension (Appukkal).	800·00	442	15th August 1895.	..	..	....	..	..	....	20,941·82 800·00	
3	Thellai (part) ..	10,760·00	178	29th June 1888 ..	1,421·06	G.O. 1370	10th May 1913 ..	..		....	..	Enclosure Nos. 20, 21, 19, 18 and 8.
								2,352·00	345	16th July 1915 ..		Transferred to Santavasal Range.
					12·45	C.C.F. 82	29th February 1924.	325·24	233	18th April 1913.	..	
4	Nellimalai ..	2,796·80	268	1st June 1894 ..	750·80	20	12th January 1926.	..	..	....	6,649·31	
5	Athiyoor	4,800·00	238	16th May 1892 ..	62·24	400	3rd November 1919.	..	..	....	2,046·00	
					51·39	376	22nd May 1941 ..	..	..	....	..	
6	Kylasagiri ..	2,534·40	327	28th June 1894 ..	..	..	....	..	..	....	4,686·37	
7	Tiruvallam plantation.	464·32	154	3rd May 1919 ..	..	..	....	..	..	....	2,534·40	
											464·32	

8	Kilminal plantation.	150·05		147	21st March 1916.	..		..	....	..	..	....	150·05	
9	Vannivedu plantation.	57·52		401	28th October 1919.	0·41		91	21st March 1925.	..	..	....	57·11	
10	Banavaram ..	1,021·42		36	12th February 1891.	..		..	....	..	..	....	..	
		45·45	G.O.	1098	20th March 1918.	0·29		86	4th September 1906.	..	..	....	1,064·58	
11	Virinchipuram—													
	Bit I	95·91		136	24th April 1919.	..		..	....	..	..	....	} 258·14	
	Bit II	26·75		137	Do.	..		..	....	..	..	....		
	Bit III	135·48		138	Do.	..		..	....	..	..	....		
12	Chennur plantation.	129·64		1340	5th December 1884.	..		..	....	..	..	....	129·64	
13	Vikramanchi plantation.	128·99		144	21st May 1889 ..	..		..	....	..	..	....	128·99	
14	Ammundy plantation.	163·00		277	7th July 1920 ..	..		..	....	..	..	....	163·00	
									(2) *Odugathur Range.*					
1	Ambur	27,878·40		251	5th May 1893 ..	1,209·73	G.O.	1370	10th May 1913 ..	..	..	....	..	Enclosure Nos. 93, 94 and 95.
		6·83		337	17th October 1922.	14·66	G.O.	748	1st April 1916 ..	..	..	....	..	
						144·01		260	18th February 1922.	..	..	....	..	
						8·48		..	....	..	..	....	..	As per erratum to Notification No. 260, dated 18th February 1922.
													26,333·35	
2	Ambur Fuel ..	5,452·80		241	5th December 1884	..		..	....	..	..	....	5,452·80	
3	Ambur plantation.	6·10		241	Do.	..		..	....	..	..	....	6·10	
4	Vellakkal	5,036·80		503	23rd September 1893.	..		..	....	..	..	....	5,036·80	
5	Karuthamalai ..	20,486·40		555	14th October 1895.	217·00		66	14th February 1922.	..	..	....	..	
		11·95		8	17th January 1933.	176·00		348	29th November 1928.	..	..	....	..	
		14·74		131	10th April 1933.	141·90		18	17th December 1938.	..	..	....	..	
		11·95		178	16th April 1936.	2·31		864	17th October 1939.	..	..	....	19,987·83	
6	Shanankuppam ..	13,843·20		212	29th April 1898.	114·685		10	12th Februray 1921.	..	..	....	..	
		2·07	G.O.	3908	4th December 1917.	8·20		81	12th July 1915 ..	..	..	....	..	
		15·20		262	20th September 1923.	1·60		71	9th March 1923.	..	..	....	13,735·98	

Serial number.	Reserve.	Original settlement. Area in acres.	No.	Date.	Disafforestation. Area in acres.	No.	Date.	Transferred elsewhere. Area in acres.	No.	Date.	Present area in acres.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
						(3) Santavasal Range.						
1	Thellai (part) ..	6,529·00	178	29th June 1888 ..	..	..	....	..	..	....	..	
		350·24	233	18th April 1918.	..	..	....	..	..	....	6,879·24	
2	Arasampattu (part).	4,414·00	345	16th July 1915 ..	..	..	....	..	..	....	..	
		4,527·00	G.O. 1444	18th April 1918.	..	..	....	4,056·00	..	....	4,885·00	Transferred to Vellore Range.
3	Puthur	18,457·60	179	8th September 1888.	..	..	....	..	..	....	..	
					6,616·60	G.O. 1370	10th May 1913 ..	..	..	..	..	Enclosure Nos. 39, 40, 41 (part) 45 to 48, 50, 51, 52 (part) and 62.
					38·17	229	17th September 1921.	..	..	....	14,802·83	
4	Santavasal	9,670·40	302	5th June 1893 ..	26·77	G.O. 1312	9th July 1919 ..	..	..	....	..	
		91·64	51	31st March 1921.	..	..	....	..	..	....	9,735·27	16 inclusions.
5	Santavasal extension A and B.	330·80	G.O. 128	6th March 1894.	..	..	....	..	..	....	330·80	
6	Malayalam ..	26,080·00	353	6th August 1891.	..	..	....	..	..	....	..	See foot note (a).
					610·83	G.O. 1312	9th July 1919 ..	..	..	....	25,726·66	
7	Karnatighur ..	7,270·40	241	5th December 1884.	..	..	....	..	..	....	7,270·40	
8	Vellimalai	2,003·20	155	28th March 1895.	..	..	....	..	..	....	2,003·20	Resumed from panchayat reserve in 1946–47.
						(4) Polur Range.						
1	Patrakad	25,254·00	181	3rd July 1888 ..	..	..	....	..	..	....	..	Enclosure Nos. 61 to 64, 75 to 77, 78 bit II (part), 79, to 81, 82/4, 83, 84, 86/2, 87 to 90.
					1,461·13	G.O. 1370	10th May 1913 ..	..	..	....	23,779·98	
					12·89	992	8th December 1939.	..	..	....	..	

2	Veerappanur ..	31,468·80		180	3rd July 1888 ..	.. 8,325·19	G.O.	1370	10th May 1913 ..	..	..	....	..	Enclosure Nos. 44, 49, 68 to 74, 78, bit I, II (part), III to VI, 91 and 92.
						11·76		229 A	17th September 1921.	..	..	....	..	
						52·17		999	8th December 1939.	..	..	....	23,079·68	
3	Periamalai	6,969·60		513	1893 ..	..	..		....	..	..	....	6,969·60	
4	Mulakad	15,744·00		72	1894 ..	..	..		....	..	..	....	..	
		25·94		183	19th June 1923 ..	60·95		90	21st March 1932.	..	..	....	..	
						179·70	G.O.	1370	10th May 1913 ..	..	..	....	15,529·29	Enclosure Nos. 82/2, 84, 81 and 86.
5	Arasampattu (part).	1,848·00	G.O.	1444	18th April 1918.	..	..		....	..	..	....	1,848·00	
6	Arasampattu extension.	24·44		82	25th October 1918.	..	..		....	..	..	....	24·64	A difference of 0·2 acre could not be reconciled. Reserved from panchayat reserve in 1946–47.
7	Allialamangalam ..	7,597·00		310	22nd June 1892.	72·83		144	31st March 1911.	..	..	....	..	A difference of 0·54 acres could not be reconciled.
						2·11		185	8th June 1923 ..	..	..	....	..	
						2·05		264	9th June 1932 ..	..	..	....	7,520·55	
							(5) *Tiruvannamalai Range.*							
1	Ponniar	26,897·20		210	18th May 1897 ..	..	..		....	..	..	....	26,897·20	
2	Valasamalai ..	7,625·60		284	18th May 1895 ..	..	..		....	..	..	....	7,625·60	
3	Nattampalli ..	5,188·50		532	7th November 1894.	..	..		....	..	..	....	..	
		5·91		148	5th May 1922 ..	..	..		....	..	..	....	5,194·41	
4	Perungalathur Swami Malai.	6,055·70		286	6th August 1877.	..	..		....	..	..	....	..	
		33·63		148	5th May 1922 ..	..	..		....	..	..	....	6,089·33	
5	Pavunjipattu ..	4,360·00		25	18th May 1894 ..	38·00		260	20th September 1923.	..	..	....	..	
						8·12		145	18th May 1925 ..	..	..	....	4,313·88	
6	Royandapuram ..	2,714·00	G.O.	1150	19th August 1935.	..	..		....	..	..	....	2,714·00	
												Total ..	310,846·15	

33. *Unreserves.*—Though the unreserves are not under the administrative charge of the District Forest Officer, the extraction of sandalwood and the disposal of minor forest produce from such lands is carried out by the forest department, and the revenue derived from sales, by the Revenue Department, of other produce is incorporated in the divisional accounts.

34. *Panchayat reserves.*—Between December 1914 and August 1928, 144 reserves aggregating 325, 192·13 acres were transferred to panchayat control consequent on the formation of Chingleput division from 16th July 1946. One hundred and six panchayat reserved forests have been transferred to that division and two panchayat reserved forests namely Alialamangalam and Vallindai have been taken over to the Vellore East division—vide paragraph 142. At present there are only 36 panchayat reserved forests in this division a list of which is given in Appendix III.

35. *Position of sandal on patta lands.*—Paragraph 4 of Government Order No. 1462, Revenue, dated 10th June 1907, read together with agreements executed by pattadars in consequence thereof, clearly shows that all sandal trees growing on patta lands on the Javadis assigned after 1907 are the property of Government. Except in the Tiruppattur Javadis of the Vellore West division no pattas were issued prior to this date. Copies of the Government order and the form of agreement executed by pattadars are given at Appendices IV and V respectively.

36. *Land revenue administration in the Javadi Hill villages of the Polur and Santavasal ranges.*—Land revenue administration is at present controlled by the forest department in the hill villages of the Tiruppattur Javadis of the Vellore West division. The main reasons for this deviation from the usual system of control by the Revenue Department were to enlist the co-operation of the 'Malayalees' (a hill tribe cultivating the enclosures on the Javadis) in protecting the valuable sandal forests on the hills, and to remove the dual control which must exist as long as the Revenue and Forest departments work side by side in these tracts.

37. At a conference held on the 19th June 1933 at Tiruppattur at which the Collector, North Arcot, the Conservator of Forests, Salem circle, and the District Forest Officers, Vellore East and West divisions were present, it was decided that land revenue administration by the Forest department should be extended to the Javadi hill villages of the Santavasal Range during the then current fasli (1933–34) and to the remaining hill villages of Polur range in the next fasli year. The actual details relative to the proposed extension of the system where worked out and submitted to Government, who have ordered that the proposals should be renewed in 1936–37, as they were unable to sanction them at present. It has been laid in Board's Proceedings Rout. No. 5676, dated 4th November 1935, that the matter will be taken up by the Board when the financial conditions of the Province improve.

SECTION 9—RIGHTS AND CONCESSIONS.

38. *Granted at settlement.*—The various rights and concessions, communal and public admitted at the time of settlement are recorded in the section 16 notifications relative to each reserve. The numbers and dates of these notifications are given in columns (4) and (5) of the list reserves in paragraph 32 above.

39. *Granted subsequent to settlement.*—The undermentioned concessions have been granted from time to time, subject to definite constitutions and in return for certain services to be rendered to the department :—

(a) *Concessions under the 'Forest village system'.*—Sanction for the introduction of the 'Forest Village System' in the Javadi hill reserves of the Polur and Santavasal ranges was conveyed in G.O. No. 2687, dated 3rd December 1915, and further elaborated in B.P. Mis. No. 15, dated 10th January 1917. In 1925, Mr. Gaudoin, in paragraph 37 (i) of his working plan for the then South Vellore division, summarises the system as follows :—

"Under this system the reserved forests on the Javadi plateau, where numerous 'Malayalee' villages are scattered about as enclosures, are divided into grazing blocks. Each village or group of villages is given a grazing block and is responsible for its protection from thefts, to keep sandal trees free of cover and climbers and to supply labour (on payment) for any special works undertaken by the department. In return the department grants the concession of refunding annually to the 'Malayalees' the full amount of grazing fees paid by them if protection and co-operation are found good in their respective grazing blocks. The grazing fees, at three annas per cow unit, are fixed on the basis of a triennial census of cattle taken in each village. No possibility is fixed. Refunds are proportionately reduced, or entirely withheld according as protection and co-operation have been fair or bad. The 'Malayalees' are given further concession of free removal of (unclassified) timber, fuel, bamboos and thatch grass for agricultural and domestic purposes."

(*b*) *Extension of the 'Forest village system' to the hill villages of that part of the Thellai reserve situated in the Vellore Range.*—This area originally fell under the scope of (*c*) below but the Chief Conservator of Forests, in his Proceedings Miscellaneous No. 342, dated 13th July 1922, sanctioned the introduction of the 'forest village system' briefly described in (*a*) above.

(*c*) *Concession to graze cattle in reserves on payment of half the usual grazing fee.*—In G.O. No. 1720, dated 25th May 1910, the malayalee villages of the Attiyur and Arasampet reserves of the Vellore range were granted the concession of grazing their cattle in reserves on payment of half the usual grazing fees on the following conditions :—

(i) They will do all in their power to prevent fires and if there is a fire they will take prompt steps to extinguish it.

(ii) They will on no account damage by hacking or otherwise sandalwood trees growing in reserves, unreserves and patta lands.

(iii) They will not hack bamboos for the purpose of feeding cattle.

(iv) They will not keep a larger number of goats than necessary for domestic purposes and will see that they do not browse in reserves.

(v) They will not permit ryots from the plains to pen cattle within their village limits unless they produce an order from the District Forest Officer permitting them to do so. In any case they will report the arrival of such cattle as soon as possible to the Range Officer.

(vi) The concession may be withdrawn at once if any, or all, of the above conditions are violated.

40. *Enclosures.*—Reference has already been made in paragraphs 29 and 30 above to the enclosures on the Javadi hills and their disafforestation in 1913. The following is a list of such enclosures :—

List of enclosures on the Javadi hills.

Block number. (1)	Name. (2)	Area. (3)	Reserved forest from which disafforested. (4)
		ACS.	
1	Kunnampalli	4·00	Arasampettu.
2	Allari	12·32	Do.
3	Do.	10·90	Do.
4	Do.	35·14	Do.
5	Do.	5·24	Do.
6	Do.	283·07	Do.
7	Marudavellimodu	32·74	Do.
8	Pariathattankuttai	71·40	Thellai.
9	Do.	8·64	Arasampettu.
10	Do.	3·75	Do.
11	Do.	2·32	Do.
12	Puthu Alamarthy kollai	5·00	Do.
13	Elluparai	39·50	Do.
14	Do.	7·30	Do.
15	Muthunur	6·97	Do.
16	Elluparai	16·74	Do.
17	Not disafforested being unoccupied.		
18	Kunrain group	405·67	Thellai.
19	Butchikavandan valasai	5·70	Do.
20	Jaratha kollai	850·60	Do.
21	Yerimodu	87·69	Do.
22	Neplampattu	374·23	Thellai and Malayalam.
23	Amerdi	25·93	Do.
24	Palapirranpatti	34·47	Do.
25	Kanamalai	211·02	Malayalam.
26	Do.	37·49	Do.
27	Elanthampattu	26·40	Do.
28	There appears to be no enclosure bearing this number which is mentioned in the Government Order.		
29	Elanthampattu	59·72	Malayalam.
30	Nirthumbai	95·06	Do.
31	Nagalur	151·03	Do.
32	Pallathur	140·42	Thellai and Malayalam.
33	Santhanpattu	3·76	Do.
34	Santhanpattu	51·96	Thellai.
35	Kottaiyam	63·78	Do.
36	Keeranur	146·72	Do.
37	Nekkanni	9·06	Do.
38	Do.	176·61	Do.

Block number.	Name.	Area.	Reserved forest from which disafforested.
(1)	(2)	(3)	(4)
		ACS.	
39	Salathu madikai	220·24	Puthur.
40	Chinnoor and Pelampattu	261·59	Do.
41	Tongamalai group	3,648·37	Puthur and Arasampettu.
42	Kottansetti	154·99	Arasampettu.
43	Not disaforested being unoccupied.		
44	Mulluvadi	165·66	Arasampettu.
45	Kudikam	134·06	Puthur.
46	Koraimadovu	58·62	Do.
47	Periapanaparai	157·69	Do.
48	Do.	44·56	Do.
49	Melmarathur	26·73	Veerappanur.
50	Muttamuthur group	4,306·90	Puthur.
51	Eraiyur	41·88	Do.
52	Kilkanavayur	33·16	Puthur and Malayalam.
53	Melkanavayur	145·04	Malayalam.
54	Puliyamkuppam	6·76	Do.
55	Do.	388·25	Do.
56	Murukkamandai	60·36	Do.
57	Shembaka tope	381·50	Do.
58	Palamadi	31·60	Do.
59	Pattimalai	121·04	Do.
60	Nellimandai	7·66	Do.
61	Kallathur	167·67	Patrakad and Malayalam.
62	Patrakad	29·36	Patrakad.
63	Kuttakarai	148·32	Do.
64	Peruveli	308·61	Patrakad and Malayalam.
65	Singadu	51·01	Malayalam.
66	Pudupattavalai	18·84	Do.
67	Velthambe	143·53	Puthur.
68	Do.	24·88	Veerappanur
69	Mandaparai and Kallapparai ..	260·55	Do.
70	Veerappannur	16·00	Do.
71	Jadayanur	25·59	Do.
72	Veerappanur	7·31	Do.
73	Do.	1·666·99	Do.
74	Pudupattu	474·14	Do.
75	Odamangalam	297·01	Patrakad
76	Thumbakollai	63·03	Do.
77	Periamalai	56·17	Do.
78	Bit I Komattiyur	2,018·01	Veerappanur and Patrakad.
	Bit II Komattiyur	1,250·91	Do.
	Bit III Komattiyur	383·60	Do.
	Bit IV Komattiyur	1,706·51	Do.
	Bit V Komattiyur	164·77	Do.
	Bit VI Komattiyur	255·99	Do.
79	Vedathope	53·33	Patrakad.
80	Ambattan kollai	44·96	Do.
81	Koleri	6·90	Do.
82-1	Koleri	19·18	Do.
82-2	Kondikallur	19·14	Mulakad.
83	Mamarathur	21·00	Patrakad.
84	Melchappali	54·35	Mulakad and Patrakad.
85	Kilchappali	70·21	Mulakad.
86-1	Palveri	106·29	Mulakad and Patrakad.
86-2	Palveri		
87	Kilpathiapattu	49·97	Patrakad.
88	Patta kovin	13·15	Do.
89	Pelavadi	67·47	Do.
90	Irumayanur	27·11	Do.
91	Natchamalai kottoy	18·75	Veerappanur.
92	Jovur	18·80	Do.
93	Naikaneri	493·53	Ambur.
94	Kamanurthettu	387·05	Do.
95	Panangatteri	329·15	Do.
	Total ..	25,175·15	

41. *Land leases.*—There are altogether 82 leases of land for temporary cultivation in the Vellore and Polur Ranges, the areas leased ranging from 0·31 acres to 24·5 acres. In

each case agreements have been drawn up each year in accordance with instructions contained in section 163 of the Forest Code. The leases are renewable annually and may be terminated at the discretion of the District Forest Officer. The following is a list of such cases.

List of temporary leases granted in reserved forest.

Number and person to whom lease have been granted. (1)	*Nature of land.* (2)	*Name of reserved forest.* (3)	*Extent.* (4) ACS.	*Assessment.* (5) RS.	A.	P.
	Vellore Range.					
1 Chinnapaya Goundan	Dry land for temporary cultivation.	Thellai Reserved Forest.	8·25	6	11	3
2 Vellayya Goundan, son of Swamy Goundan, Kuppan, son of Boochi Goundan and Papannan, son of Vellyyan.	Do.	Arasampet ..	12·00	9	12	0
3 T. Vellayya Goundan, son of Thandroyan.	Do.	Do. ..	7·40	6	0	2
4 Kolandai Goundan, c/o Thandroya Goundan.	Do.	Do. ..	6·02	4	14	4
5 Andi Goundan, c/o Vellayya Goundan ..	Do.	Do. ..	2·30	1	13	11
6 Vellayya Goundan, son of Venkatachala Goundan.	Do.	Do. ..	1·50	1	3	6
7 Vellayya Goundan, son of Perianna Goundan.	Do.	Do. ..	3·55	2	14	2
8 Thatha Goundan, son of Periyapayyan.	Do.	Do. ..	7·05	5	11	8
9 Vellayya Goundan, son of Chinnayya Goundan.	Do.	Do. ..	2·25	1	13	3
10 Chinnappayya Goundan, son of Chinnaiah Goundan.	Do.	Do. ..	7·00	5	11	0
11 Kolandai Goundan, son of Papanna Goundan.	Do.	Do. ..	3·50	2	13	6
12 T. Vellayya Goundan, son of Papanna Goundan.	Do.	Do. ..	1·125	0	14	8
13 Kolandai Goundan, son of Periyapayya Goundan.	Do.	Do. ..	4·00	3	7	3
14 Mollayya Goundan, son of Thathan ..	Do.	Do. ..	0·52	0	6	9
	Polur Range.					
15 Patrayan alias Thathan, son of Arunachalla Goundan.	Dry land for temporary cultivation.	Veerappanur ..	9·00	5	1	0
16 Muniswami, son of Chinnapayyan ..	Do.	Do. ..	5·50	3	2	0
17 Thathan, son of Chinnapayan	Do.	Do. ..	5·75	3	4	0
18 Jadavan, son of Thatha Goundan ..	Do.	Do. ..	6·50	3	11	0
19 Ramaswamy, son of Vellayyan	Do.	Do. ..	11·50	6	8	0
20 Ramaswamy, son of Chinnapayyan ..	Do.	Do. ..	10·00	5	10	0
21 Kuppan, son of Kolandai	Do.	Do. ..	2·00	1	2	0
22 Raman, son of Malayyan	Do.	Do. ..	1·50	0	14	0
23 Sengadi, son of Periapayyan	Do.	Do. ..	5·00	2	13	0
24 Kolandai, son of Raman	Do.	Do. ..	0·37	0	3	0
25 Vallayyan, son of Raman	Do.	Do. ..	1·33	Not renewed for the last three years as the lessee has abandoned the land.		
26 Chinnaswamy, son of Boochi Goundan.	Do.	Do. ..	0·37	0	3	0
27 Ooran Kuppan, son of Laksmanan ..	Do.	Do. ..	3·00	1	11	0
28 Thirupathi, son of Mottayya Goundan.	Do.	Do. ..	19·33	10	14	0
29 Vellayyan, son of Raman	Do.	Do. ..	14·00	7	14	0
30 Perumal, son of Rama Goundan ..	Do.	Do. ..	12·75	7	3	0
31 Ramaswami, son of Chinnapayyan ..	Do.	Do. ..	3·50	2	0	0
32 Appavu, son of Appavu	Do.	Do. ..	8·00	4	8	0
33 Chinnapayyan, son of Periyapayyan ..	Do.	Do. ..	8·00	4	8	0
34 Ramaswamy, son of Thatha Goundan	Do.	Do. ..	8·00	4	8	0
35 Kolandai, son of Kulla Goundan ..	Do.	Do. ..	24·50	13	13	0
36 Vellayyan, son of Kuppan	Do.	Do. ..	9·50	5	6	0
37 Pavaran, son of Jadayan	Do.	Do. ..	0·31	0	3	0
37A Do.	Do.	Do. ..	18·50	10	7	0
38 Chinna Pullai, wife of Lakshmanan ..	Do.	Do. ..	4·00	2	4	0
39 Vellayyan, son of Thatha Goundan ..	Do.	Do. ..	3·00	1	11	0
40 Ooran Ramaswami	Do.	Do. ..	10·00	5	10	0
41 Ramaswami, son of Chinnapayyan ..	Do.	Do. ..	14·00	7	14	0
42 Thatha, son of Solayyan	Do.	Do. ..	12·00	6	12	0
43 Kolandai, son of Andi	Do.	Do. ..	7·00	4	0	0
44 Parvathi, wife of Jadayan	Do.	Do. ..	2·50	1	7	6
45 Thathan, son of Vellayyan	Do.	Do. ..	7·75	4	6	0
46 Jadayan, son of Thadikara Vellayyan ..	Do.	Do. ..	6·00	3	6	0
47 Moopan Ramaswamy, son of Jadaya Goundan.	Do.	Do. ..	12·00	6	12	0
48 Annamalai, son of Perianagiah ..	Do.	Do. ..	2·00	1	2	0
49 Vengan, son of Ramaswami Goundan ..	Do.	Do. ..	9·00	5	1	0
50 Nettayyan alias Thathan, son of Ramaswamy.	Do.	Do. ..	6·75	3	13	0
51 Lakshmanan, son of Periyapayyan ..	Do.	Do. ..	3·75	2	2	0
52 Annamalai, son of Muthan alias Vellayyan.	Do.	Do. ..	7·75	4	6	0
53 Mandalakara Raman, son of Thathan ..	Do.	Do. ..	6·25	3	8	0
54 Kuppan, son of Lakshmanan	Do.	Do. ..	7·96	4	8	0

Number and person to whom lease have been granted. (1)	Nature of land. (2)	Name of reserved forest. (3)	Extent. (4)	Assessment. (5)
			ACS.	RS. A. P.
	Polur Range—cont.			
55 Kolandai, son of Kumbia Goundan ..	Dry land for temporary cultiavtion.	Veerappanur ..	4·50	2 9 0
56 Muthu Goundan, son of Andi Goundan.	Do.	Do. ..	1·75	1 0 0
57 Chinnapayyan, son of Komali alias Kolandai.	Do.	Do. ..	6·50	3 11 0
58 Vellai Andi, son of Perianna Goundan.	Do.	Veerppanur Reserved Forest.	16·50	9 5 0
59 Nattan Annamalai, son of Kolandai Goundan.	Do.	Do.	10·00	5 10 0
60 Andi Goundan, son of Thambi alias Chinnapayan.	Do.	Do.	8·50	4 13 0
61 Ooran Raman, son of Periyapayyan ..	Do.	Do.	13·5	7 10 0
62 Vallamonji, son of Manjakuttai ..	Do.	Do.	6·75	3 13 0
63 Kuppan, son of Palani Goundan ..	Do.	Do.	8·35	4 12 0
64 Chinnappayyan, son of Nadupayyan ..	Do.	Do.	5·75	3 4 0
65 Balaraman Goundan, son of Kuppa Goundan.	Do.	Do.	20·00	11 4 0
66 Konayan Andi, son of Palani Goundan.	Do.	Do.	20·00	11 4 0
67 Arunachallam, son of Sevathan ..	Do.	Do.	3·25	1 13 0
68 Andi, son of Annamalai	Do.	Do.	2·50	1 7 0
69 Kuppan, son of Kolandai	Do.	Do.	4·00	2 4 0
70 Perumal, son of Chinnapayyan	Do.	Do.	3·50	2 0 0
71 Palani, son of Annamalai ..	Do.	Do.	6·50	3 11 0
72 Vellayyan, son of Gundian	Do.	Do.	3·50	2 0 0
73 Nettalathan alias Kolandai, son of Raman.	Do.	Do.	3·80	2 2 0
74 Kolandai, son of Thathan	Do.	Do.	1·60	0 14 0
75 Pakkan, son of Raman	Do.	Do.	5·00	2 13 0
76 Perumal, son of Lakshmanan	Do.	Do.	1·12	0 10 0
77 Jadayan, son of Perumal	Do.	Do.	7·50	4 4 0
78 Chinnakutti, son of Kuppan	Do.	Do.	5·12	2 14 0
79 Nettalathan alias Chinnapayyan, son of Vallayan.	Do.	Do.	8·00	4 8 0
80 Ramaswami, son of Muruga Goundan ..	Do.	Do.	14·50	8 3 0
81 Kolandai, son of Ramaswami	Do.	Do.	0·56	0 5 0
82 Natesan, son of Perianna Goundan ..	Do.	Do.	2·50	1 7 0

CHAPTER II—THE FOREST.

SECTION 1—COMPOSITION AND CONDITION OF THE CROP.

42. *General*—The forests are of the mixed deciduous type, irregular and very variable in density. For the purpose of description it is convenient to adopt the classification referred to in paragraph 5 above, viz. :—

(i) Hill forests, situated on the Javadis and on the southern slopes of the Kalroyan Hills in the extreme south of the division,

(ii) plains, forests, including the isolated reserve of Banavaram on the Madras and Southern Mahratta Railway between Katpadi and Arkonam, and

(iii) the Palar river plantations at Tiruvallam, Kilminal, Vannivedu, Virinjipuram, Vikramachi, Senur and Ammundi. The areas of these plantations are to be found in the list of reserves at paragraph 32 above.

Hill forests.

43. *The Javadis.*—These constitute the most valuable part of the division as they contain about 85 per cent of its sandal and bamboo areas. Sandal and bamboo are both major sources of revenue. Actuals taken over a period of eleven years, 1935–36 to 1946–47, show that these two items contributed 34 and 24 per cent respectively towards the average annual revenue of this divsion. (vide statement at paragraph 226 below).

44. *Sandal* grows in patches, the area of which may vary from a fraction of an acre up to several hundred acres. The patches are scattered throughout the forest and it is often very difficult to account for the total absence of the species from certain parts which appear to be similar in every respect to neighbouring areas where it is growing luxurantly. Possibly it may have been distributed evenly in the past, and destroyed by fire or by the wholesale removal of hosts. Natural regeneration is good and as the species is a strong light demander it occurs plentifully in abandoned cultivation, round enclosures and along paths and boundary lines. The fact that in areas once under cultivation, the soil has been worked up and exposed to the action of weather and to the visits of birds, which feed on sandal fruit, probably also accounts for such areas being well stocked.

45. *Bamboo.*—Two species, *Dendrocalamus strictus* and *Bambusa arundinacea* occur, the former growing mostly on slopes above 1,500 feet, while the latter is confined to the plateau and bottoms of valleys down to about 800 feet. Both species are frequently found mixed over comparatively large areas on the plateau. In the valleys *Bambusa arundinacea* grows to the almost total exclusion of *Dendrocalamus strictus*.

46. There is also a variety of *Bambusa arundinacea*, locally known as ' Iruvarai,' which is less thorny than the ordinary large bamboo, the clumps less congested and the culms thicker walled. In fact it is sometimes mistaken for *Dendrocalamus strictus*.

47. *Dandrocalamus* grows ordinarily to a girth of about 8 inches at the base, while *Bambusa arundinacea* attains, in places, a corresponding girth of about 18 inches. In parts of Arasampettu, Veerappanur and Malayalam reserves, *Dandrocalamus strictus* grows almost solid and the culms are used as lance slaves for the Indian cavalry and as lathis for the police force.

48. Mention should here be made of a most deplorable state of affairs brought about by overcutting *Dendrocalamus strictus* around enclosures, hackling for fodder in accessible localities and the removal of tender culms for basket making. *Bambusa arundinacea* though less susceptible to damage, has also been badly overworked and culms cut at anything from 5 to 15 feet from the ground. This subject is further dealt with in paragraphs 79 and 173 below.

49. *Flowering and dying of bamboos.*—In paragraph 4 of his working plan for the bamboo forests of the South Vellore Division, Mr. K. R. Venkataramana Ayyar, in 1919, records that a gregarious flowering of *Bambusa arundinacea* appears to have taken place in about the years 1895 to 1897, while *Dandrocalamus strictus* similarly flowered and died in 1900. Previous flowering of *Dendrocalamus strictus*, possibly sporadic, in about 1878 is also recorded, but no details of this are available. Flowering of bamboos (both *Bambusa arundinacea* and *Dendrocalamus strictus*) were observed in various reserves of this division from 1936–37 to 1943–44. By the end of hot weather of 1943, the gregarious flowering of both the species of bamboos was complete. Natural regeneration was adequate and it was observed that *Bambusa arundinacea* had regenerated more satisfactorily than *Dendrocalamus strictus*. The latest record in 1945-46 shows that there has been only sporadic flowering of *Dandrocalamus strictus* in the Kalroyan bamboo block of Tiruvannamalai range. The earliest record of flowering in 1878 does not appear to be correct for seventeen to twenty-two years only appear to have lapsed between it and the next flowering in 1895–1900, while the interval between the commencement of the last flowering and the latest flowering is 38 years.

50. *Other species.*—The growth of other species varies with the conditions of the locality. A few isolated trees of teak, rosewood, *Pterocarpus marsupium* and *Terminalia tomentosa* are to be found, but these are stunted and ill grown. Except for sandal and bamboo the crop is generally unsaleable and therefore valuable only as hosts for sandal and as a soil cover. Too much emphasis cannot however be placed on its value as a soil cover and an important factor in flood control and prevention of soil erosion.

51. *Undergrowth.*—The undergrowth is for the most part of the persistent thorny type in which *solanum indicum*, *Pterolobium indicum*, *Carissa carandas* and *Euphorbia spp.* predominate. Occasional patches of grass are seen and generally indicate a shallow and impoverished soil. As one would expect, creepers and climbers are not predominant, although they do sometimes arrest one's attention when they grow into and weigh down the crowns of healthy young sandal trees. This usually occurs on the outskirts of enclosures and abandoned cultivation where light conditions are favourable. The most commonly met with climber is *accacia intsia*.

52. *Prickly pear* (*Opuntia dillenii*) exists, but its spread has been checked very efficiently by the activity of the Cochineal insect. The writer has not yet seen a really vigorous plant in the division.

53. *Lantana.*—Except for a few patches, aggregating some 320 acres in extent in the Arasampet, Virappanur and Patrakad reserves, lantana is absent from the Vellore East Javadis. This is very remarkable in view of the fact that the pest covers extensive areas in the adjoining Vellore West Division.

54. *The Kalroyan Hills.*—The northen slopes of these hills, comprising the Valasamalai, Nattampalli and Perunkolathur Swamimalai reserves, support a type of forest similar to that on the Javadis, except that sandal has appeared comparatively recently. This latter fact is evident not only from the size of the trees, but also from the almost complete absence of deadwood. The species shows signs of spreading rapidly.

55. Over about 1,500 acres on the Valasamalai plateau timber species are fairly well represented, but the trees are generally poor specimens, being ill-shapen, gnarled and of poor height growth. A rank growth of coarse grasses either forms the only undergrowth or is prominent in it. Apart from the degraded condition of the area, due doubtless to fires, the situation is inaccessible, so much so that even illicit removals are rare.

Plains forests.

56. These forests are composed of an irregularly stocked low scrub of poor density often degenerating into sparse bushes with occasional ill-shapen and shunted trees. Easy accessibility, and consequent illicit felling and overgrazing, coupled with less favourable conditions of temperature and rainfall are the chief factors by which this degraded state has been brought about. The poorest area are to be found in the Kylasagiri, Appukal, Nellimalai, Shanankuppam and Vellakal reserves of the Odugathur and Vellore ranges.

57. The following species are well represented, though the trees are poor specimens. Girths exceeding about 2 feet 6 inches are seldom found.

Chloroxylon swietenia.	*Stereosperumum suaveolens.*
Albizzia amara.	*Cleistanthus collinus.*
Albizzia lebbek.	*Azadirachta indica.*
Acacia sundra.	*Diospyros spp.*
Hardwickia binata.	*Strychnos nuxvomica.*
Anogeissus latifolia.	*Strychnos potatourm and Erythroxylon monogynum.*

58. Sandal is found scattered in places and seems to have been introduced artifically by occasional distribution of seed by forest guards during the course of patrolling. It is found chiefly along foot-paths, road margins, reserve boundaries, etc. In many cases specimens are small and unhealthy looking and it is doubtful if they will ever grow large enough to produce heartwood. On the banks of streams and where host conditions are more favourable, the sandal, where it occurs ; is healthy and shows signs of spreading.

59. Teak, *Pterocarpus marsupium* and rosewood are rare, stunted and gnarled, due of course to repeated illicit cuttings.

60. Tamarind is very common and is usually the best tree in the forest. In the dry season it retains its foliage while everything around it is parched and leafless. It is not felled as fuel, as it is more valuable on account of its fruit, an important minor forest product. There is little doubt that the species is particularly suitable to this dry, degraded type of forest. In the Thellai valley it constitutes about 50 per cent of the crop.

61. *Bamboo.—Dandrocalamus strictus* is proportionately much lesser than *Bambusa arundinacea. Bambusa arundinacea* is found near the outer slopes of the hills in the vicinity of streams and water courses ; but nowhere in the plains does it approximate the vigour with which it grows in the hill forests.

62. *Prickly-pear* (*Opuntia dillenii*).—This species used to be common in the plains forests, and troublesome, but never to a degree sufficient to cause alarm. However, consistent with the then general policy for its complete eradication throughout the Presidency, the cochineal insect was introduced in 1931 and what remains of the prickly-pear today shows that it is definitely a dying species.

63. *Lantana.*—Occurs sporadically over about 900 acres in Arasampet, Vellakkal and Santavasal reserves and along the banks of the Ponniar river in the Tiruvannamalai Range. It does not appear to be spreading and the local villagers say that it has been in its present conditions for several years.

Palar river plantations.

64. These plantations were started in 1873 and planting continued up to 1890. Only casuarina was planted and the rotation adopted was 10 years. In 1890 a severe drought occurred and thousands of trees died. Nothing more appears to have been done till 1896, when Mr. Popert, then the Conservator of Forests, Southern Circle, ordered that blanks should be planted up with *Albizzia lebbek, Albizzia amara, Melia indica, Eugenia jambolana, Pithecolobium dulce, Pithecoloium saman, Cassia florida, Cassia roxburghii, Xizyphus jujuba, Acacia leucophloea, Caesalpinia coriaria, Hardwickia binata, terminalia arjuna, Terminalia belarica, Terminalia tomentosa, Berrya ammonilla* (Trincomale wood), teak, red-sanders, mahogani, tamarind and palmyrah. It is recorded that the probable reason for discontinuing the sowing of casuarina was that the area had already yielded three crops of the species and that the soil was incapable of sustaining a fourth crop.

65. As regards the condition of Palar plantations, at the time of Mr. Brand's writing the working plan the stocking was very irregular. This was observed to be probably due to abruptly varying soil conditions. Large calcarious, usually low-lying, blanks had occurred. The results of early sowings had shown that the species most suited to the locality were tamarind, *Pithecolobium dulce*, *Pithecolobium saman*, *Media indica* and *Terminalia arjuna* was the only species which had succeeded in the calcarious blanks which became water-logged in the rainy weather.

Out of the seven Palar plantations five of them have since been converted into casuarina plantation starting from 1942. The two plantations left out are Senur and Viramanchi as the soil is found to be unsuited for casuarina. The casuarina plantations are being worked as per the scheme drawn up by Mr. Mitchell and sanctioned in Salem Circle Conservator's R. Dis. No. 1659/44, dated 11th September 1944, but they are not successful.

66. *Red sanders.*—The species has established itself successfully as a pure crop over about 25 acres in the Senur plantation. The rate of growth here is, it is stated, up to date better than it is in districts where the species grows naturally. There is a prolific crop of seedlings under each parent tree, but most of them die back annually. The cause for this is believed to be root competition and is being investigated by the Provincial Silviculturist. In the other plantations occasional trees are found scattered in places.

67. *Cassia siamea*, introduced at a later date, is growing very well indeed and its reproduction by coppice shoots is particularly good. A shoot one season old was measured and found to be 25 feet in height. All these have since been clear-felled for the introduction of casuarina.

68. Sandal of varying age and density is found practically throughout and is flourishing. In fact, in Vikramachi and Virinjipuram plantations it is so dense that it needs immediate thinning. All sandal trees have since been uprooted in all the plantations except Vikramachi and Senur for raising casuarina plantations.

69. *Undergrowth.*—The casuarina plantations are practically free from any undergrowth except few coppice shoots from Morinda, Pithocolobium dulce and other fuel species. The spear grass is noticed in blanks.

70. *Prickly-pear* (*Opuntia dillenii*).—In his working plan for the Palar plantations, Mr. T. N. Hearsey, in 1916 records that there was a good deal of prickly-pear in Virinjipuram, while in the northern part of Vikramachi the growth was very dense. To-day the pest is almost extinct, once more thanks to the cochineal insect.

71. *Botanical list.*—A botanical list of trees, shrubs and climbers found in the division is given in Appendix VI.

SECTION 2—INJURIES TO WHICH THE CROP IS LIABLE.

72. By far the most serious damage to the crop is caused wilfully by man. The plains forests are easily accessible from the surrounding villages, while those on the hills are interspread by numerous enclosures. Offences are of daily occurrence, although the vast majority of them pass unnoticed. The following statement of detected cases will perhaps give some idea of the extent of the damage for which man is responsible. The figures represent annual averages for a period of eleven years, 1936–37 to 1946–47.

Statement of offences.

Nature of offence.	*Vellore Range.*	*Odagathur Range.*	*Santavasal Range.*	*Polur Range.*	*Tiruvannamalai Range.*	*Division.*
1 Injury to forest by fire	..	0·3	0·4	..	0·5	1·2
2 Unauthorized felling and removal of forest produce.	235·3	227·0	120·8	110·6	172·0	865·7
3 Illicit grazing	83·5	34·3	25·2	15·6	16·5	175·1
4 Other offences	4·1	2·5	5·8	4·5	10·0	26·9
Total ..	322·9	264·1	152·2	130·7	199·0	1,068·9

73. The various forms of damage are considered below.

74. *Fire.*—Fires do an immense amount of harm to the forest, both directly by destroying growth, especially the scanty and much wanted natural regeneration, and indirectly by stimulating the growth of grasses and other undesirable weeds. A striking example, though perhaps an extreme case, of the manner in which undesirable weeds respond to fire is to be found on the fire line running up the Karnatigur hill in the general direction of the bridle path. Repeated burning has greatly increased the growth of rank grasses and in places where the fire has been very intense, generally on the lower sides of the zigs where grass and other inflammable material has naturally piled itself up, a prolific growth of *Pterolobium indicum* has appeared and formed itself into dense impenetrable thickets to the complete exclusion of other species. It is even spreading into places where a reasonably good canopy exists.

75. Fires are particularly destructive to sandal which is very fire sensitive. The bark as well as the cambium of even large trees is often completely destroyed on the fire side. Regeneration in burnt areas is absolutely wiped out.

76. *Theft.*—Illicit felling is ripe in this division. The contributory causes for this are various. Theft of small timber for agricultural implements and for building huts is the commonest form of offence. As generally only valuable species are removed, the forest is gradually becoming depleted of such species. Apart from the actual loss of material, the manner in which the removals, are effected does a considerable amount of harm. Trees and saplings are felled 3 to 4 feet from the ground and are thereby not given a chance of reproducing themselves by coppice shoots. Species which suffer most are *Chlorozylon swietenia, Acacia sundra, Acacia leucophloea, Albizzia lebbek* and *Anogeissus latifolia.* Also trees are lopped and hacked mercilessly for the collection of green manure leaves. The species that suffer most are *A. Amara* and *Wrightia tinctoria.* The other causes are given in paragraphs 78 and 79.

77. Illicit felling of sandal for the purpose of selling the heartwood is rare. The opening up of the forest and the operation of the sandalwood transit rules are the principal factors which have almost brought about the disappearance of theft of this sort.

78. In recent years due to scarcity of firewood illicit felling and removal of fuel species, both green and dry, is observed throughout the division. Bamboos are sometimes removed, but a much more serious form of damage is the lopping of *Dandrocalamus strictus* for cattle fodder. This brings us to the next form of damage, viz., lopping and hacking.

79. *Lopping and hacking.*—*Dendrocalamus strictus* is more frequently damaged in this way than is *Bambusa arundinacea.* Brief reference has already been made in paragraph 48 above to the present general degraded state of the bamboo areas. Mr. C. C. Wilson, Conservator of Forests, who prepared the present sandalwood working plan for the Javadi and Yelagiri (Vellore West Division) hills in 1916, is of opinion that the stock of *Dendrocalamus strictus* has ' definitely and gravely ' deteriorated since that date. In 1924, Mr. A. V. Sundaram, Extra Assistant Conservator of Forests, was placed on special duty to consider measures to improve the condition of the bamboo forests of the Polur Range, and he records that two of the chief factors which contributed to the unsatisfactory state of affairs were the lopping of *Dendrocalamus* culms for cattle fodder and cutting the top ends for ' valichals ' (one season old splits used for basket-making) and ' afinis ' (inner soft pliable splits used as fibre for tying). Other reasons amounting to a breach of silvicultural regulations are dealt with under ' Systems of management and their results ' in Chapter V.

80. Occasional lopping of sandal is met with. Fortunately this form of evil seems to have decreased very considerably in recent years. In paragraph 11 (*c*) of his working plan referred to in the foregoing paragraph, Mr. C. C. Wilson records " . . . . and it is their (Malayalee) herdsmen who lop the branches of and even fell large sandal trees to provide fodder for cattle and goats . . ." In an area of 301 acres in the Puliyur unreserve of the Vellore West Division, Mr. Wilson counted 216 sandal trees which were illicitly felled for this purpose. Undoubtedly the same state of affairs existed in the Vellore East Division also. The disappearance of the evil is due to the special protection which sandal enjoys under the ' Forest Village System', introduced in 1917 [vide paragraph 39 (*a*) above]. The reaction however has been unfortunate for the ' Malayalee,' while leaving sandal alone, has concentrated his efforts on the wholesale lopping of *Dendrocalamus strictus.*

81. *Bark stripping.*—Sandal trees are sometimes barked for the purpose of chewing. In paragraph 11 (*c*) of his working plan, Mr. C. C. Wilson further records " . . . . every path on the hills is lined by decrepit half-flayed sandal trees in a more or less dying condition . . . ." Although this form of damage is not nearly as bad as it was, it is still in evidence and is now probably due more to the mischief of cattle boys than to the removal of bark for eating.

82. Other species are often found stripped of their bark for the extraction of fibre. The most striking of these is *Hardwickia binata*. In the Palar river plantations, efforts at introducing the species have in many cases failed as promising young saplings have been completely stripped of their bark.

83. *Animals*.—The damage caused by wild animals is inconsiderable as the fauna of the district is markedly scanty.

84. *Grazing*.—The damage done by cattle is twofold, viz., (i) browsing down and trampling on tender seedlings, particulraly sandal and (ii) hardening the surface soil by their continual tread and thereby rendering it unsuitable for the reception of seed.

85. The incidence of grazing is dangerously high, specially in the neighbourhood of villages. The average incidence for the division, based on the actuals of the twelve-year period 1934–35 to 1945–46, works out to 4·2 acres per 'cow' head, i.e., after reducing all cattle grazed to cow units (1 buffalo=2 cows and 1 sheep=½ a cow). Separate details for each range are to be found at Appendix VII.

86. *Climatic*.—Directly, wind is not generally responsible for any serious damage. Whirl-winds occasionally occur at the commencement of the south-west monsoon, but these are of mild intensity and do little or no damage. Indirectly, the damage due to wind is considerable, for the east wind which blows throughout the fire season is an important factor in causing the spread of fire and often renders control impossible when a fire has occurred. Abnormal distribution of rainfall is of some importance in that it has a direct bearing on the fire season, the duration and intensity of which depend on the amount of rain precipitated in the preceding north-east monsoon.

87. *Injurious plants*.—Among these may be mentioned lantana, grass, *Pterolobium indicum* and creepers and climbers generally lantana and grass are indirectly important on account of the risk from fire in areas where they grow. *Pterolobium indicum* forms itself into dense thickets and prevents the seed of other species from reaching the ground. It may perhaps, because of its evergreen nature, have the advantage of acting as a fire-break, but this advantage could never be of any value in areas where the species has established itself to the complete exclusion of everything else.

88. Creepers and climbers are not a serious factor. They occur, but do not grow to any size. *Acacia intsia* is the commonest, and is occasionally found growing into and weighing down the crowns of sandal trees.

89. '*Spike' disease in sandal*.—At the time of Mr. Brand writing the working plan the division was practically free from spike, except eight trees found in the specially protected block near Patrakad rest-house. But from 1936–37 spike trees were detected year by year in Polur Range. The infected trees were killed by Atlas solution and they were extracted. During 1941–42 and 1942–43 no fresh attacks were observed, but again in 1943–44 fresh attacks were noticed again in Veerappanur reserved forest of Polur Range. A forester is appointed to take necessary steps in preventing spike from 1938. The following statement gives an idea of the operations carried on up to 1945–46 :—

1	Number of trees lopped up to 31st March 1946	25,281
2	Number that manifested the disease	2,502
3	Number that died without manifesting the disease	1,040
4	Number of trees extracted including sap and heartwood ..	24,302
5	Cost of control measures till the end of 1945–46	Rs. 1,872
6	Quantity of rough cleaned wood extracted	489 tons 25 qrs.

CHAPTER III—UTILIZATION OF THE PRODUCE.

SECTION 1—AGRICULTURAL WANTS AND CUSTOMS OF THE PEOPLE.

90. *The population*.—The population of the neighbouring plains villages need not be described. The inhabitants of the hill tracts are a hybrid race known as 'Malayalees', and are said to have descended from the Vedars, Vellalals and Goundars. Their pursuits are purely agricultural.

91. *Wants of the population.*—The main requirements of the population are fuel, small timber for agricultural implements and building purposes, bamboos, green leaf manure, thatch fodder and broom grass and grazing.

92. *Fuel and small timber.*—In the plains and in the Kalroyan hills the fuel and small timber requirements of the villagers are met largely from panchayat reserves, and private holdings and by illicit removals. Annual clearing of newly assigned pattas and of Sivayi-jama lands is also a source of supply. The bulk of the produce felled annually in the several fuel coupes is carted to the towns to meet a larger demand. The inhabitants of the hill villages enjoy the concession of free removal of fuel and unclassified timber, as well as bamboos and thatch grass, for agricultural and domestic purposes in return for protection from theft and fire, tending sandal and supplying labour for any special work undertaken by the department—vide paragraph 39 (*a*) and (*b*) above.

93. The species most commonly used for ploughs are *Chloroxylon swietenia* and *Acacia leucophloea* for the share, *Acacia sundra* and *Grewia tilioefolia* (when available) for the shaft, while almost any species is used for the handle. Occasionally shares are made of *Anogeissus latifolia*, but only when better species are not available.

94. *Bamboos.*—The requirements of the plains villagers are met by purchase in the local markets or by theft. The latter source is not considerable as the growth of bamboo in the plains forests is very limited. As in the case of fuel and small timber, the villagers on the hills are allowed free removal of bamboos for bona fide domestic purposes.

95. *Green leaf manure* attracted much attention some 22 years ago. In paragraph 8 of his working plan, Mr. H. W. A. Gaudoin, in 1925, records " There is not only a demand but a clamour for manure leaf ever since its removal was stopped from 1st July 1917." In his plan Mr. Gaudoin prescribed a Manure Leaf Working Circle, which was composed of reserves which have since passed into panchayat control. Subsequently, steps were taken to supplement this panchayat supply by throwing open, for removals on payment, certain departmental reserves. The subject is further dealt with in paragraph 113 below.

96. *Thatch, fodder and broom grass.*—Considerable quantities of grass, particularly for thatch and making brooms, are removed annually by the villagers in accordance with definite rules framed for the purpose—vide paragraph 116 below.

97. *Grazing.*—The ryots keep large herds of cattle chiefly for the sake of the manure they yield. The average number of cattle, reduced to ' cow ' units, grazed annually for the last eleven years is 68,457. Grazing is thus the most important demand of the people.

SECTION 2—MARKETS AND MARKETABLE PRODUCTS.

98. *Marketable products.*—Consist of sandalwood, bamboos, fuel, charcoal, minor forest produce and thatch, fodder and broom grass. There is practically no marketable timber in the division. The very limited quantity of small timber which is obtained in fuel coupes from time to time goes towards satisfying the requirements of the neighbouring villages for material for agricultural implements, posts, etc., for hut building. The Banavaram reserve and the Senur plantation are leased out annually to the Military Grass Farms for the removal of hay for supply to troops in the Southern Command and whenever there is no demand from the military, they are leased out to private contractors. This subject has been dealt with in detail in paragraph 117 below.

The classification of sandalwood, bamboos and minor forest produce is dealt with in the three following paragraphs.

99. *Sandalwood.* The classification of finally cleaned stemwood, rootwood and chips is laid down in paragraph 39 of 'Rules regarding selection, felling, cleaning, classification and disposal of sandalwood and the method of maintaining depot accounts and other registers" —Revised edition, 1930. This pamphlet will be referred to in future as the Sandal Extraction Rules.

100. *Bamboos.*—All bamboos are classified by merchants before sale. The statement below gives the local names of the various classes, a brief description of each and the uses to which it is put. The information contained in the statement has been collected partly from paragraph 7 of Mr. K. R. Venkataramana Ayyar's working plan for bamboos and minor forest produce in the South Vellore Division (1920), and partly from enquiry in the

local markets. The costs of collection should really appear in section 4, 'Methods of exploitation and their cost,' but they are given here so as to avoid repetition of the classification when that section is dealt with.

Classification of Bamboos.

Kind of bamboo. (1)	*Number and local name.* (2)	*Brief description.* (3)	*Uses.* (4)	*Cost of collections (ex-forest depots).* (5)
Bamboo arundinacea—Extracted green.	1 Doola varai .. (தூலவாரை)	Mature bamboos above three years, old cut usually above 2 nodes from the base, 12 to 24 feet long and 10 to 13 inches girth.	Scaffolding, pandals, wall-plates and ridge pieces.	7½ annas each.
	2 Katta varai or Kadai pottu. (கட்டவாரை)	Mature bamboos more solid than No. 1, cut above 2 nodes from the base, 6 to 8 feet long and 9 to 12 inches girth.	Pillars, bressummers and ridge poles.	2½ annas each.
	3 Dera varai .. (டேரா வாரை)	Thick walled, 10 to 15 feet long and 8 to 10 inches girth at the base.	Tent posts and ridges ..	5 annas each.
	4 Yenikkal .. (ஏணிக்கால்)	Same as No. 3 but only 6 to 7 inches girth.	Ladders	4 annas each.
	5 Dokku varai (டொக்கு வாரை) or Udavu (உதவு) or Konai varai (கொனை வாரை) or Monaikolundu (மொனைக் கொழுந்து)	Portions of culms above Nos. 1 to 4, 10 to 15 feet long and about 7 inches girth at the base and 2 inches at tip.	Pandals, rafters for thatched houses, and cross pieces for scaffolding.	10 annas per bundle of 10 pieces.
	6 Kitti baddai or Ani baddai. (கிட்டி பத்தை அல்லது ஆணி பத்தை)	No. 2 split into two, three or four equal parts.	Reepers for tiled houses, or cross pieces for frames of single bullock carts. If required for cross pieces of double bullock carts, these are obtained from No. 3 which is split into two halves.	10 annas per bundle of 20 splits.
	7 Tottil baddai .. (தொட்டி பத்தை)	No. 2 split into two halves.	Diagonal pieces connecting the shaft with the frame of double bullock carts.	2½ annas per pair.
	8 Alagu baddai .. (அலகு பத்தை)	No. 2 split generally into four or five equal parts but only 4½ feet long.	By weavers	9 annas per bundle of 50 splits.
	9 Kathikkal (கத்திக்கால்) or Karumbuthotta Gootam.	Lower portions of bamboos which may be green or dry 7 to 9 feet long, and 4 to 6 inches in girth with all but 2 to 3 inches length of branches from each node cut off.	Standards in sugarcane plantations.	Rs. 9 per 100 pieces.
	10 Simbal.. .. (சிம்பல்)	Small top ends with branches intact.	Fencing and screens ..	Not usually sold.
Dendrocalamus strictus—Extracted green.	1 Vittam (விட்டம்) Nathi (நாத்தி) Dandeethu moongil (தண்டேத்து மூங்கில்)	Solid or nearly solid bamboos, mature, 12 to 15 feet long and 3 to 3½ inches girth at base where it is cut slantwise.	Cross pieces in betel leaf and sugarcane plantations; also for pandals. If split into two halves, used as tie rods for securing the thatch to the roof in thatched houses.	10 annas per bundle of 20 pieces.
	2 Veetu moongil or Urukkali. (வீட்டு மூங்கில் அல்லது உருக்கழி)	Same as No. 1 but with the bottom cut square 12 to 14 feet long and 3 to 3½ inches girth at the base.	Roof frames of thatched houses.	Do.
	3 Valichal(வலிச்சல்) or Veda baddai. (வேத பத்தை)	Split bamboos usually obtained from culms less than one year old, cut from 1 to 2 feet above ground. Length 12 feet.	Mats, baskets of sorts, screens and fibre for tying bamboos into bundles.	10 annas per bundle of 50 splits.
	4 Veda Pootti .. (வேத பூட்டி)	Same as No. 3 but removed in whole bamboos, the purchaser doing the splitting.	Do.	2½ annas each bamboo.
	5 Korathabbai (கொரதப்பை) or Koravalichal (கொரவலிச்சல்)	Same as No. 3, but 15 feet long.	Do.	Re. 1-3-0 per bundle of 100 pieces.
	6 Alagu baddai .. (அலகு பத்தை)	Bottom portions, if fairly solid, of No. 1 or 2, split into two halves, 4½ feet long.	By weavers	9 annas per bundle of 50 pieces.
	7 Banathadi or Kuthiraithadi. (பாணத்தடி அல்லது குதிரைத்தடி)	Mature solid bamboos 4 to 6 feet long and nearly uniformly 3 to 5 inches girth throughout.	Lathis and walking sticks, longer ones are in demand for lance staves and tent kanats.	Re. 1-2-0 per bundle of 10 pieces.

Classification of Bamboos—cont.

Kind of bamboo. (1)	*Number and local name.* (2)	*Brief descriptions.* (3)	*Uses.* (4)	*Cost of collections (ex-forest depots.)* (5)
Dendrocalamus strictus—Extracted green—*cont.*	8 Kaman or Kamankuchi. (கமரன் அல்லது கமான் குச்சி)	About 2 years old bamboos, solid, about 10 feet long and 2 inches girth at base and 1½ inches at top.	Tops of jutkas and country carts.	10 annas per bundle of 30 pieces.
	9 Yethakol .. (எத்தக்கோல்)	Mature straight bamboos with their rhizomes seasoned over a fire in the forest before being transported to forest depots; about 23 feet long and 6 to 7 inches girth at the base.	Picottah poles	10 annas each.
	10 Banakkoloy .. (பாணக்குழாய்)	Hollow bamboos, 4½ feet long and 2 to 3 inches girth solid.	Cut into smaller pieces about 4 inches long and used for fire rockets.	10 annas per 25.
Dendrocalamus strictus—Naturally dry bamboos.	1 Kattaikal or Goottam. (கட்டைக்கால் அல்லது கூட்டம்)	Mature, solid or nearly solid bamboos, obtained from the bottom portions of culms, 4½ feet long and about 5 to 6 inches uniform girth.	Queen posts of roof trusses in thatched houses and also as uprights for the sides of country carts with tops.	5 annas per bundle of 20 pieces.
	2 Jantai or Karnai. (ஜன்டெ அல்லது கர்ணை)	Same as No. 1 but 6 feet long and 4 to 5 inches in girth.	Joists for mud terraces ..	10 annas pr bundle of 24 pieces.
	3 Toluvam or Anjumolum Kalani. (தொழுவம் அல்லது அஞ்சு முழம் காலணி)	Less solid than No. 1, 7 to 9 feet long, taken from the bottom portions of culms and 3 to 4 inches girth at base.	Reepers for tiled roof building.	Do.
	4 Arumulam Kalani. (ஆறு முழம் காலணி).	Sams as No.2 but 9 feet long.	Used for the same as No. 1	Do.
	5 Labbakkatu or Sippakkattu. (லப்பக்கட்டு அல்லது சிப்பக்கட்டு)	Top ends of bamboos above No. 3, 6 feet long and 2 to 2½ inches girth at the base.	Flooring in ships carrying a cargo of groundnut.	2½ annas per bundle of 24 pieces.

101. *Minor forest produce.*—The chief minor forest products and their uses are—

Serial number and name.	*Description and botanical name.*	*Use.*
1 Avaram bark ..	*Cassia auriculata*	Tanning.
2 Konnai bark	*Cassia fistula*	Do.
3 Gallnuts	Fruit of *Terminalia chebula*	Do.
4 Pungam	Seed of *Pongamia glabra*	Yields an oil used for dressing, leather after it is cured.
5 Surul bark	From the roots of *Ventilago calyculata* and *V. Madraspatna.*	Yields a black dye.
6 Kapilapodi	Red powdery glands on the capsule of *Mallotus philippinensis.*	Yields a yellow dye.
7 Tagari	Seed of *Cassia tora*	A mordant used in dyeing.
8 Yattikottai	Seed of *Strychnos nux vomica*	Yields strychnine.
9 Thettankottai ..	Seed of *Strychnos potatorum*	Used medicinally. Also an agent for clearing water.
10 Serankottai	Nuts of *Semicarpus anacardium*	Yields an oil used in the manufacture of marking ink and medicinally for external applications.
11 Kattamanakku ..	Seed of *Jairopha curcas*	Yields an oil used medicinally for external application.
12 Nellikoy	Fruit of *Phyllanthus emblica*	Used medicinally when dry, and is edible when green.
13 Manipungam or soap-nut.	Fruit of *Sapindus trifoliatus*	Washing and toilet purposes.
14 Tamarind	Fruit of *Tamarindus indica*	Edible.
15 Woodapple	Fruit of *Feronia elephantum*	Do.
16 Elandai	Fruit of *Zizyphus jujuba*	Do.
17 Kalakkai	Fruit of *Carissa carendus*	Do.
18 Sarapparuppu ..	Kernels of the fruit of *Buchanania latifolia* ..	Do.
19 Kavadu grass ..	*Andropogon citratus*	Yields the lomon grass oil of commerce.
20 Honey and bees wax.	....	....
21 Deer and sambur horns.	....	....
22 Other miscellaneous products, such as gums, creepers and barks for fibre, etc.	....	....

102. *Markets.*—Sandalwood is sold annually at Tiruppattur and is usually purchased by merchants from Bombay and Kozhikode. There is practically no local demand. The principal markets for bamboos, fuel and charcoal are Vellore, Ambur, Arni, Polur and Tiruvannamalai. The export of bamboos to neighbouring districts although dull at the time of writing, was common in the past, the chief outside markets being Cuddalore, Pondicherry, Bowringpet (for the Kolar gold fields), Madras and even Tanjore and Tiruchirappalli. It would appear that the groundnut trade has a direct bearing on the demand for bamboos in sea port towns.

When this trade is flourishing, merchants require considerable quantities of bamboos annually for the erection of temporary godowns, cooly sheds and for rough decking for country boats carrying cargo of this produce. During the war, bamboos were exported to various centres for the military purposes. Due to the dearth of fuel, large quantities of firewood are being exported to Madras.

103. The whole output of avaram and konnai barks, gallnuts and pungam seed is consumed by tanneries within the district. The more important tanneries are at Vaniambadi, Ambur, Vellore and Ranipet. Yettikottai is transported to Madras, whence it is shipped abroad. Soapnut, although it is not much used locally, finds a ready market in Telugu districts and is transported to Tenali, Guntur and Nellore. The small quantity of kapila powder which is collected annually is sold at Arni, Kumbakonam, Kancheepuram and Tiruvettipuram, which are all important weaving centres.

SECTION 3—LINES OF EXPORT.

104. *Railways.*—The Madras and Southern Mahratta Railway, running approximately north-east and south-west, passes more or less along the northern boundary of the division from Arkonam in the north-east corner, via Katpadi, to Vaniambadi at its western extremity. The South Indian Railway traverses the centre of the division from Katpadi in the north by Tandari in the south. Except for the Palar river plantations and the Banavaram reserve, near Arkonam, the whole of the forest area lies between these two lines.

105. *Trunk roads.*—The Bangalore-Madras road passing through Vaniambadi, Ambur, Vellore and Walajapet runs along the north of the division, more or less parallel to the Madras and Southern Mahratta Railway. The Chittoor-Cuddalore road touching Vellore, Vaniambadi, Santavasal, Polur and Tiruvannamalai is practically parallel to the South Indian Railway.

106. *Other metalled roads.*—There are many other metalled roads and they connect the forest roads either with the railways or with the local markets on the trunk roads.

107. *Forest roads.*—The forests are well provided with roads. The more important roads serving as outlets from the Javadi hills are—

(i) The Komattiyur-Alangayam ('Gillman') road running westward to Vaniambadi on the Madras and Southern Mahratta Railway and to the sandalwood sale depot at Tiruppattur.

(ii) The Komattiyur-Athimur road running eastwards via Patrakad to Polur on the South Indian Railway. As far as Patrakad it is known as 'Lushington' road.

(iii) The Komattiyur-Odugathur road running northwards via Burgur and Melarasampet and joining the main Bangalore-Madras road, five miles west of Vellore.

(iv) The Mandapare-Burgur road running westwards joins No. (iii) at Burgur.

(v) The Nadanur Kinnikollam road running more or less north-east via Amerdi and joining the metalled road to Vellore and Vaniambadi some 12 miles south of Vellore. From Nadanur to Amerdi it is known as 'Latham' road.

(vi) The Panangatteri-Ambur road running north-west.

(vii) The Panangatteri-Odugathur road running north-east via Asanampet and joining the metalled road from Odugathur to Vellore.

(viii) Mandaparai-Nadanur road running more or less north-east and meeting the Nadanur-Kinnikollam road at Nadanur.

108. The plains forests are served by—

(i) The Tellai-Kinnekollam road running east and joining No. (v) above at Kinnekollam.

(ii) The Odugathur-Anicut road running northwards via Pinnathurai and joining the metalled road from Anicut to Vellore.

(iii) The Chenbakatope-Santavasal road running eastwards and joining the metalled road from Santavasal to the Arni Road railway station on the South Indian Railway.

SECTION 4—METHODS OF EXPLOITATION AND THEIR COST.

109. *Sandalwood*.—The exploitation of sandalwood is carried out departmentally. The various stages of the operation are dealt with in the Sandal Extraction Rules (Revised Edition, 1930). The cost of exploitation is as follows :—

	PER TON.		
	RS.	A.	P.
(i) Marking and enumerating dead trees for extraction—Eleven pies per acre. Data collected from the Polur and Santavasal ranges for the second and third rotations of Mr. C. C. Wilson's Sandalwood Working Plan show that there are, on an average, 0·24 dead trees per acre and that the average yield of heartwood per tree is 1 qr. 8 lb. 11 oz. Applying these averages to the rate of eleven pies per acre, this stage of the operation costs.	14	11	0
(ii) Extraction, rough cleaning and transport to forest depots, at seven annas per quarter.	35	0	0
(iii) Re-weighing rough cleaned wood at forest depots before despatch to the sale depot at Tiruppattur.	0	14	0
(iv) Transport by road from forest depots to the sale depot at Tiruppattur, for every 50 miles.	31	8	0
(v) Re-weighing at Tiruppattur, and taking to stock	0	12	0
(vi) Final cleaning at Re. 0–5–0 per quarter	25	0	0

110. *Bamboos*.—All bamboo coupes are worked through the agency of contractors. Blocks comprising one or more felling series, of three coupes each, are leased out once in three years, the lessee having the right to work only one coupe in each series annually. The costs of collection, ex-forest depots, paid by contractors for the various kinds of bamboo are given in column (6) of the statement in paragraph 100 above.

111. *Fuel*.—All coupes are worked through the agency of contractors. Coupes are generally sold in February and March and the period of working runs from 1st April to 31st March. Payments are made by contractors at the following rates :—

	PER TON.		
	RS.	A.	P.
(i) Felling and loading on to carts	4	0	0
(ii) Carting from coupe to market, per mile	0	8	0

No billetting or stacking is done, the fuel being cut only into cartable sizes.

112. *Charcoal*.—There is no departmental working. Fuel coupe contractors manufacture charcoal in coupes from which either the whole or part of the crop is unsaleable as firewood because of poor demand, inaccessibility or remoteness from markets. The cost of production is as follows :—

	PER TON.		
	RS.	A.	P.
(i) Cutting, burning, filling into bags and loading on carts, at one rupee per bag of 70 lb.	32	0	0
(ii) Transport from coupe to market, per mile	0	8	0

113. *Green leaf manure*.—Reference has already been made to this subject in paragraph 95 above. After the reserves constituting Mr. Gaudoin's Manure Leaf Working Circle had passed into panchayat control, removals were permitted at Re. 1–4–0 per cart-load from the reserves of the Odugathur range and at Rs. 2 per cart-load from those reserves in the other ranges, which in, the opinion of the Chief Conservator, could be thrown open for removal (G.O. No. 2268-D, Development, dated 20th December 1929). In the Santavasal, Polur and Tiruvannamalai ranges, nine blocks were put up for sale for the first time in August 1933, but owing to inaccessibility and poor growth, only four blocks were sold at an average price of Rs. 281 per block. In 1934, the same nine blocks were again put up for sale, but none was sold. As per working plan prescriptions, the working circle composed of 12 blocks aggregating 17,580 acres. This area was found inadequate and an extra area of 22,126 acres were added on and the system also altered with a three year's rotation instead of the original annual working. Subsequently the demand arose for green leaf manure around Vellakkal Reserved Forest of Odagathur Range, which was not originally thought of. Consequently an area of 500 acres was regularly thrown open annually from 1943–44 under proper sanction.

Working Plan prescribed removal by permits at Re. 1–4–0 per cart-load for Vellore and Odagathur ranges and Rs. 2 for the Santavasal, Polur and Tiruvannamalai ranges. Subsequently it has been amended and permits are issued at the rate of Re. 1 per cart-load

and one anna per head-load in Santavasal, Polur and Tiruvannamalai ranges and annas 12 per cart-load and 9 pies per head-load in Vellore and Odagathur ranges, until further orders.

114. *Minor forest produce.*—The right of collecting minor forest produce is sold once in five years in the case of konnai (*Cassia fistula*), bark and annually for other kinds of produce. The lease period commences on the 1st July each year and terminates on the 30th of the following June. Collection, ex-forest depots, of the more important products is usually paid for at the following rates :—

(i) *Tamarind.*—In return for collection, coolies are given from one-tenth to half the quantity collected by them. Where trees are plentiful or when the crop is good, collection is easy and coolies are given a smaller proportion. Conversely where trees are scattered or when the crop is poor, collection is difficult and coolies receive a larger proportion. Removal of shells and cleaning is paid for at 3 annas per maund of 25 lb.

(ii) Avaram bark (*Cassia auriculata*), 6 pies per lb. or Re. 0–12–6 per maund of 25 lb.

(iii) Konnai bark (*Cassia fistula*), 6 pies per lb. or Re. 0–12–6 per maund of 25 lb.

(iv) Sural bark roots only (*Ventilago calyculata* and *V. Madraspatana*), 6 pies per lb. or Re. 0–12–6 per maund of 25 lb.

(v) Gallnuts (*Terminalia chebula*), 1 anna per measure or Re. 0–12–0 per maund of 25 lb.

(vi) Yettikottai (*Strychnos nux vomica*), 1 anna per measure or Re. 0–10–0 per maund of 25 lb.

(vii) Tettankottai (*Strychnos potatorum*), 1 anna per measure or Re. 0–8–0 per maund of 25 lb.

(viii) Pungam (*Pongamia glabra*), 1 anna per measure or Re. 0–10–0 per maund of 25 lb.

(ix) Soapnut (*Sapindus trifoliatus*), 1 anna per measure or Re. 1–1–0 per maund of 25 lb.

(x) Kapila powder (*Mallotus philippinensis*), 8 annas per measure.

115. The question of collecting tamarind departmentally was investigated by the working plans staff and from data collected, it was considered that the present system of selling the right of collection annually, with that for other minor forest produce, is more profitable than departmental collection would be.

116. *Thatch, fodder and broom grass.*—In accordance with the recommendations of the Royal Commission on Agriculture, 1929, free removal of thatch, fodder and broom grass from the reserved forest by the inhabitants of adjoining villages, is permitted subject to the conditions noted below :—

(i) Removals should be for the bona fide domestic and agricultural use of the villagers and not for sale.

(ii) The concession of free removal from any reserve applies only to the villagers adjoining it and to no others.

(iii) Removals should be effected only in head-loads.

(iv) The concession runs from the 1st September to the 15th April each year.

(v) Breach of any of the conditions will entail prosecution.

(vi) If fires occur or forest growth is damaged by felling, lopping or hacking, not only will the concession be cancelled, but any portion or the whole of the reserves notified may be closed to grazing.

The names of reserves and a list of villages adjoining each is published in the District Gazette annually.

117. *Removal of hay by the Military Grass Farms.*—The Banavaram reserve and the Senur plantation are leased out annually to the Military Grass farms for the removal of hay at Rs. 4 per ton till 1938–39. Prior to 1933–34 royalty was paid at Rs. 2 per ton only. Cutting and removal is restricted to the period 1st July to the 15th March each year. Stacking and pressing is permitted within the area in question, necessary precautions being taken to protect buildings and forest growth. Removals are effected by railway from Sholinghur station in the case of Banavaram reserve and latter in the case of Senur plantation. Both these stations are on the Madras and Southern Mahratta Railway. From 1939–40 the right to collect hay from Banavaram and Senur plantation was not leased to the Military grass farm as grass was not required by the Military department. As per orders of the Chief Conservator of Forests, permits were issued for the collection of hay from

Banavaram reserved forest at Re. 1–4–0 per cart-load. From 1940–41 to 1945–46 the right to collect hay from Banavaram reserved forest was leased out to contractors. In 1946–47, the Military department again took up the collection of hay for Rs. 1,115.

118. *Grazing.*—Grazing, subject to the usual conditions, is allowed in all reserves, with the exception of the following areas :—

(i) Fuel coupes are closed to grazing in the year of felling and for five years after. (Paragraph 18 of Mr. H. W. A. Gaudoin's Working Plan, 1925 for the South Vellore division).

(ii) All sandal specially protected blocks. (Paragraph 39 of Mr. C. C. Wilson's Sandalwood Working Plan, 1916—for the Javadi and Yelagiri hills.)

(iii) The Banavaram reserve. (Section XXXVI of Mr. V. S. Gurunatha Pillai's Working Plan, 1909—for the East Vellore range.)

(iv) The Palar river plantations. (Section XXXVII of Mr. T. N. Hearsey's Working plan, 1916—for these plantations.)

119. The grazing year is from 1st July to 30th June. Fees are collected at the following rates :—

	RS.	A.	P.
Local cattle—			
Cow or bull	0	4	0
Buffalo	0	8	0
Sheep	0	2	0
Foreign cattle—Tiruvannamalai range only—			
Cow or bull	0	8	0
Buffalo	1	0	0

Goat browsing is strictly prohibited and no licences are granted for penning cattle in the reserves.

120. The Malayalees of the Javadi hills in the Santavasal and Polur ranges and Thellai reserve situated in the Vellore range enjoy free grazing under the terms of the ' Forest Village System '—Vide paragraph 39 (*a*) and (*b*) above. The whole of the grazing areas on the plateau and in Thellai reserve already referred to is reserved exclusively for the exercise of this concession and has been divided into 153 grazing blocks. Plains cattle are not allowed to graze in these blocks.

121. In the Vellore Range the Malayalees residing in the Attiyur and Arasampattu reserves are allowed to graze their cattle on payment of half the usual fees—Vide paragraph 39 (*c*) above.

SECTION 5—PAST AND CURRENT PRICES.

122. The following statements give the prices obtained for sandalwood, bamboos, fuel and minor forest produce for the period relating to Mr. Brand's Working Plan.

8 Paragraph 123.

Statement showing the prices obtained for sandalwood from **1935–36** *to 1946–47 at Tirupattur Sales Depot.*

(Price per ton in Rupees.)

Serial number and name of classes. (1)	1935–36. (2)	1936–37. (3)	1937–38. (4)	1938–39. (5)	1939–40. (6)	1940–41. (7)	1941–42. (8)	1942–43. (9)	1943–44. (10)	1944–45. (11)	1945–46. (12)	1946–47. (13)	*Remarks.* (14)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	
Billets.													
1 Vilyatbudh (first class) ..	No. yield and hence no sale in these classes.												
2 Chinabudh (second class) ..													
3 Panjam (third class)													
4 Ghotta (short billets) ..													
5 Ghat Badla	845	758	706	666	647	532	865	686	1,104	2,237	2,573	5,007	
6 Bagardad	853	739	702	639	657	688	899	694	1,142	2,271	2,525	5,122	
7 Jaipokal (first class) ..	755	697	624	568	565	549	872	661	1,142	2,059	2,416	4,765	
8 Jaipokal (second class) ..	756	679	615	580	575	564	859	662	1,159	2,027	2,412	4,581	
9 Ainbagar	765	660	621	588	582	639	858	679	1,167	1,999	2,395	4,534	
10 Cheria	730	631	554	545	545	608	850	638	1,128	1,908	2,303	4,450	
Roots.													
11 First class	805	868	758	703	729	680	1,000	785	1,332	2,411	2,692	5,045	
12 Second class	838	851	790	729	810	812	1,099	835	1,400	2,483	2,787	5,208	
13 Third class	831	902	847	765	844	886	1,166	896	1,478	2,582	2,947	5,406	
Chips.													
14 Ainchilta	625	580	523	517	522	534	832	645	1,038	1,815	2,285	4,300	
15 Hathrichilta	No yield and hence no sale.												
16 Mulvachilta	403	416	382	374	417	410	649	420	741	1,359	1,789	3,403	
17 Basolubakni	321	353	330	342	349	381	549	379	706	1,306	1,736	3,425	
18 Sawdust..	660	475	491	402	430	465	530	500	1,000	1,853	2,525	4,548	

Paragraph 124.

Statement showing the prices obtained for the bamboo coupes from 1936–37 to 1947–48 in Vellore East Division.

Name of felling series.	1936–37.		1937–38.		1938–39.		1939–40.		1940–41.		1941–42.	
	Area of coupe.	Price.	Area of coupe.	Price.	Area of coupe.	Price.	Area of coupe.	Price.	Area of coupe.	Price.	Acra of coupe	Price.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	ACS.	RS.	ACS.	RS.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS.
Odugathur Range.												
Karuthamalai	5,095	1,868	4,730	647	6,694	2,294 0	4,947	1,832 0	4,391	1,374 0	6,694	1,470
Asnampet	2,393		3,470		2,611	1,772 0	2,528	1,416 0	3,597	1,062 0	5,139	1,200
Vellakkal	3,026	1,900	2,409	1,425	3,315		3,085		2,490		6,400	
Panangattery	1,220		2,146		1,734	833 10	1,338	666 8	2,112	499 14	3,072	310
Naikanery	4,295		3,215		4,288		6,374		2,912		10,662	
Vellore Range.												
Athiyur	2,528	784	1,464	426	..	..	2,574	1,250 0	1,527	750 0	4,256	440
Thellai	2,260	2,514	4,662	1,506	4,016	2,922 0	2,176	2,336 0	4,836	1,752 0	4,016	1,250
Kottur	1,725	1,152	3,091	858	3,322	1,090 3	1,639	1,091 12	3,999	818 1	3,322	1,522
Komiar	1,600	*	1,203	1,375	1,434	1,100 0	1,690	825 0	1,203	625 0	1,434	500
Santhavasal Range.												
Thongumalai	1,760		1,719		1,197		1,817		1,719		1,197	
Naickanur	990	3,060	1,954	4,125	1,599	3,300 0	947	2,475 0	1,954	3,419 0	1,599	2,732
Kudigam	1,024		1,101		1,434		998		1,101		1,434	
Nekkini	1,170		1,749		1,424		1,024		1,749		1,424	
Sathampattu	990		1,642		691		1,159		1,642		691	
Nadanur	1,376	7,998	1,728	13,940	1,828	11,120 0	1,229	8,340 0	1,728	12,500 0	1,828	10,000
Kanumalai	715		493		531		877		493		531	
Puliankuppam	1,100		1,905		1,449		790		1,905		1,449	
Bonganur	1,160		1,332		1,473		1,404		1,332		1,473	
Shenbagatope	1,410	11,400	1,645	16,720	2,086	13,360 0	2,029	10,020 0	1,645	14,169 0	2,086	11,332
Santhavasal	1,160		2,400		1,363		1,299		2,400		1,363	
Polur Range.												
Pudupattu	1,624		1,830		1,562		1,939		1,830		1,562	
Veerappanur	1,240	5,298	2,042	7,350	1,073	5,800 0	1,146	4,350 0	2,042	7,610 0	1,073	6,080
Mandaparai	910		894		1,066		789		894		1,066	
Palankottai	980		2,069		4,486		844		2,069		4,486	
Tekkmarthur	980	1,500	723	5,500	506	4,400 0	934	2,000 0	723	2,713 0	506	2,164
Motlapattu	910		410		506		1,038		410		506	
Odamangalam	1,370		1,210		1,549		1,187		1,210		1,549	
Kuttukarai	1,350	2,499	2,236	7,350	1,806	5,800 0	1,331	4,350 0	2,236	5,000 0	1,806	4,000
Kuttakarai Experimental.	..		405		135		135		405		135	
Kondikallur	1,700		1,763		2,047		1,734		1,763		2,047	
Vedatope	960	1,248	1,593	4,250	755	3,400 0	811	2,550 0	1,593	2,794 0	755	2,232
Palavadi	1,792		1,325		1,248		2,004		1,325		1,248	
Tiruvannamalai Range.												
Valasamalai	1,280		1,952		1,738		1,414		1,952		1,738	
Nattampalli	1,280	1,875	1,350	4,565	1,178	3,620 0	1,274	2,715 0	1,350	3,169 0	1.178	2,532
Perungalathur Swamymalai	896		659		1,075		845		659		1,075	

Name of felling series.	1942–43. Area of coupe. (14)	1942–43. Price. (15)	1943–44. Area of coupe. (16)	1943–44. Price. (17)	1944–45. Area of coupe. (18)	1944–45. Price. (19)	1945–46. Area of coupe. (20)	1945–46. Price. (21)	1946–47. Area of coupe. (22)	1946–47. Price. (23)	1947–48. Area of coupe. (24)	1947–48. Price. (25)
	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
Odugathur Range—cont.												
Karuthamalai	4,947	1,160	4,391	870	6,694	36,050	4,947	2,800	4,391	2,100	6,694	4,822
Asnampet	3,597	550	2,611		2,528		3,597		2,611		2,528	
Vellakkal	2,490		3,315	750	3,085	600	2,490	450	3,315	4,169	3,085	3,332
Panangattery	2,112	250	1,734		1,338		2,112		1,734		1,338	
Naickanery	2,912		4,288		6,374		2,912		4,288		6,374	
Vellore Range—cont.												
Athiyur	2,574	320	1,527	240	4,256	1,677	2,574	1,336	1,527	1,002	4,256	1,669
Thellai	2,176	1,000	4,836	750	4,016	5,516	2,176	4,408	4,836	3,306	4,016	7,008
Kottur	1,639	1,216	3,999	912	3,322	2,735	1,639	2,180	3,999	1,635	3,322	2,544
Komiar	1,690	375	1,203	735	1,434	580	1,690	435	1,203	1,246	1,434	988
Santhavasal Range—cont.												
Thongumalai	1,817		1,719		1,197		1,817		1,719		1,197	
Naickanur	947	2,049	1,954	3,750	1,599	3,000	947	2,250	1,954	5,625	1,599	4,500
Kadigam	998		1,101		1,434		998		1,101		1,434	
Nekkini	1,024		1,749		1,424		1,024		1,749		1,424	
Sathampattu	1,159	7,500	1,642	8,338	691		1,159	4,998	1,642	15,000	691	12,000
Nadanur	1,229		1,728		1,828		1,229		1,728		1,828	
Kannamalai	877		493		531	6,664	877		493		531	
Pulankuppam	790		1,905		1,449		790		1,905		1,449	
Bonganur	1,404	8,499	1,332	1,0419	1,473	8,332	1,404	6,249	1,332	18,988	1,473	15,184
Shenbagatope	2,029		1,645		2,086		2,029		1,645		2,086	
Santhavasal	1,299		2,400		1,363		1,299		2,400		1,363	
Polur Range—cont.												
Pudupattu	1,939		1,830		1,562		1,939		1,830		1,562	
Veerappanur	1,146	4,560	2,042	7,919	1,073	6,332	1,146	4,749	2,042	9,794	1,073	7,832
Mandaparai	789		894		1,066		789		894		1,066	
Palankottai	864		2,069		4,486		864		2,069		4,486	
Tekkamarathur	934	1,623	723	4,172	506	3,336	934	2,502	723	6,261	506	5,008
Motalapattu	1,038		410		506		1,038		410		506	
Odamangalam ..	1,187		1,210		1,549		1,187		1,210		1,549	
Kuttukarai	1,331	3,000	2,641	5,419	1,806	4,332	1,331	3,249	2,641	10,233	1,806	8,184
Kuttukarai Experimental..	135		..		..		..		..		..	
Kondikallur	1,734		1,763		2,047		1,734		1,763		2,047	
Vedatope	811	1,674	1,593	5,000	755	4,000	811	3,000	1,593	7,349	755	5,872
Palavadi	2,004		1,325		1,248		2,004		1,325		1,248	
Tiruvannamalai Range—cont.												
Valasamalai..	1,414		1,952		1,738		1,414		1,952		1,738	
Nattampalli	1,274	1,899	1,350	5,419	1,178	4,332	1,274	3,249	1,350	17,511	1,178	10,708
Perungalathur Swamy-malai.	845		659		1,075		845		659		1,075	

* In 1936–37, 1,600 acres of Komiar Felling Series was sold along with Thangamalai Naickanur and Kudigum felling series for Rs. 3,060.

Paragraph 125. *Statement showing prices obtained for fuel coupes from 1936-37 to 1947-48.*

Felling series.	1936-37.		1937-38.		1938-39.	
	Area of coupe.	*Price per acre.*	*Area of coupe.*	*Price per acre.*	*Area of coupe.*	*Price per acre.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.
		Odugathur Range.				
(*a*) Regular series—						
Ambur	92	2 8	85	7 0	93	3 4
Naickaneri	102	6 0	93	18 8	96	15 4
Panangatteri	..	..	..	..	..	..
Pallipathu	59	2 4	..	..	28	2 4
Kuppampalayam	44	2 4	50	2 8	45	2 6
Asanampet	80	2 4	74	3 4	..	..
Thattankinar	54	4 0	58	3 0	73	3 4
		Vellore Range.				
Komiar	90	3 8	79	4 12	76	2 4
Usoor	78	20 8	70	16 0	66	26 8
Vellakal	56	6 4	47	8 4	55	16 8
Thellai	88	10 0	80	12 4	84	8 0
Plantation, East	14	124 0	15	110 0	15	98 0
Plantation, West	20	50 0	19	46 0	19	27 4
Karungalthody	84	6 8	66	13 12	64	7 8
		Santhavasal Range.				
Amerdi	26	8 4	28	8 4	22	14 0
Santhavasal	54	10 0	61	2 8	62 } 21 }	2 9 } 2 9 }
Karnatagiri	92	10 5	78	18 8	84	17 0
		Tiruvannamalai Range.				
Thaniar	80	5 0	..	..	93	4 0
Pullimedu	..	..	25	5 12	36	6 4
Ponniar, East	106	15 0	87	9 14	103	7 6
(*b*) Reserve series—						
Pannangatteri (Odugathur Range).	..	..	..	..	..	..
Kallaparai (Odugathur Range).	..	..	..	..	..	..
Jambumalai (Polur Range).	..	..	..	..	..	..
Ponniar, West (Thiruvannamalai Range).	..	..	..	..	..	..

Felling series.	1939-40.		1940-41.		1941-42.	
	Area of coupe.	*Price per acre.*	*Area of coupe.*	*Price per acre.*	*Area of coupe.*	*Price per acre.*
	(8)	(9)	(10)	(11)	(12)	(13)
	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.
		Odugathur Range—cont.				
(*a*) Regular series—						
Ambur	86	5 0	84	1 0	84	7 4
Naickaneri	82	7 8	97	6 0	111	14 4
Panangatteri	..	..	82	2 8	72	8 8
Pallipathu	38	2 14	40	2 11	40	4 8
Kuppampalayam	40	4 8	44	1 4	45	4 0
Asanampet	..	..	65	2 8	74	4 0
Thattankinar	57	3 12	56 } 7 }	5 6 } 3 12 }	49	7 0
		Vellore Range—cont.				
Komiar	78	5 0	77	2 10	80	5 0
Usoor	58	23 8	53	15 10	71	9 8
Vellakal	45	8 2	51	8 2	42	20 8
Thellai	84	5 12	79	8 10	82	25 4
Plantation, East	14	160 0	14	100 0	15	81 0
Plantation, West ..	18	28 0	21	30 0	17	28 12
Karungalthody	66	7 4	63	10 14	32	23 4
		Santhavasal Range—cont.				
Amerdi	20	8 2	26	8 10	24	22 0
Santhavasal	50	13 8	52	11 12	64	21 0
Karnatagiri	91	17 4	90	12 0	81	10 8
		Tiruvannamalai Range—cont.				
Thaniar	85	2 8	86	1 4	80	4 0
Pullimedu	40	6 2	30	3 6	34	11 0
Ponniar, East	100	8 0	96	5 0	102	15 8
(*b*) Reserve series—						
Pannangatteri (Odugathur Range).	..	..	..	..	45	12 0
Kallaparai (Odugathur Range).	..	..	42	4 4	52	5 0
Jambumalai (Polur Range).	..	..	..	..	42	3 8
Ponniar, West (Tiruvannamalai Range).	..	..	..	..	49	5 0

Statement showing prices obtained for fuel coupes from 1936–37 *to* 1947–48—cont.

Felling series.	1942-43. *Area of coupe.* (14)	1942-43. *Price per acre.* (15)	1943–44. *Area of coupe.* (16)	1943–44. *Price per acre.* (17)	1944–45. *Area of coupe.* (18)	1944–45. *Price per acre.* (19)
	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.
Odugathur Range—cont.						
(*a*) Regular series—						
Ambur	90	3 4	191	2 8	167	6 0
Naickaneri	92 10	12 4 12 4	191	16 8	178	14 0
Panangatteri	85	17 4	87 82 69	15 0 3 0 13 0	165	6 0
Pallipattu	46	7 0	94	10 0	153	12 0
Kuppampalayam	43	6 8	80	15 0	130	15 0
Asanampet	71	5 4	138	4 12	226	10 0
Thattankinar	68	13 12	121	4 0	114	15 0
Vellore Range—cont.						
Komiar	87	5 4	70 92	5 0 24 0	198	25 0
Usoor	60	13 4	130½	16 12	151	22 0
Vellakal	52 6½	23 0 40 0	102	30 0	48 94	60 0 25 0
Thellai	93 20	14 4 50 0	194	7 0	183	22 0
Plantation, East	14 130	140 0 2,410 0 L.S.	73 17½ 42½	140 0 201 0 170 0	136 57 50	120 0 120 0 120 0
Plantation, West	18 44	70 0 5,000 0 L.S.	18½ 99½	60 0 1,180 0 L.S.	75 53 17 52	110 0 93 0 110 0 36 0
Karungalthody	36	15 4	68	21 0	135	15 0
Santhavasal Range—cont.						
Amerdi	19	20 4	61½	6 0	52	15 0
Santhavasal	59 11½	10 8 18 0	112	24 0	110	35 0
Karnatagiri	..	..	82 64	10 0 10 0	198	12 8
Tiruvannamalai Range—cont.						
Thaniar	92 73	3 6 2 0	68	6 4	165	14 0
Pullumedu	29	7 0	33	6 0	70	10 0
Ponniar, East	110	7 8	102	9 8	198 15	15 0 12 0
(*b*) Reserve series—						
Pannangatteri (Odugathur Range).	45	12 0	102	12 12	96 151	18 0 20 0
Kallaparai (Odugathur Range).	49	3 2	49	7 4	106	15 0
Jambumalai (Polur Range).	42	3 8	32	3 0	74	10 0
Ponniar, West (Tiruvannamalai Range).	46	5 0	..	..	43	10 0

Statement showing prices obtained for fuel coupes from 1936–37 to 1947–48—cont.

Felling series.	1945-46.		1946–47.		1947–48.	
	Area of coupe.	*Price per acre.*	*Area of coupe.*	*Price per acre.*	*Area of coupe.*	*Price per acre.*
	(20)	(21)	(22)	(23)	(24)	(25)
	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.
			Odugathur Range—cont.			
(*a*) Regular series—						
Ambur	111 200	7 0 6 0	..	..	205	11 0
Naickaneri	101	22 0	175	20 0	80	17 0
Panangatteri	164	13 0	200	16 0	..	..
Pallipattu	172	17 0	156	11 0	..	..
Kuppampalayam ..	201	16 0	214	9 0	..	..
Asanampet	167	7 0	258	18 8	231	20 0
Thattankinar	110	9 0	102	12 0	112	66 0
			Vellore Range—cont.			
Komiar	118 153	50 0 27 0	116	31 0	139	126 0
Usoor	109	35 0	135	52 0	160	64 0
Vellakal	79	20 0	105	21 0	98	20 0
Thellai	191 132	14 0 17 0	200	47 0	217	53 0
Plantation, East	56 56	190 0 150 0 L.S.	43½	112 0	..	..
Plantation, West	113 51	207 0 140 0	..	..	..	..
Karungalthody	120	45 0	133	37 0	74	50 0
			Santhavasal Range—cont.			
Amerdi	83	33 0	66	27 0	76	77 0
Santhavasal	81	33 0	77	37 0	120	70 0
Karnatagiri	187	14 0	138	12 0	170 52	16 0 106 0
			Tiruvannamalai Range—cont.			
Thaniar	27 161	16 0 16 0	235	18 0	270	51 0
Pullumedu	30 82	20 0 23 0	89 33	24 0 6 4	112	37 0
Ponniar, East	188	26 0	192	24 8	201	27 0
(*b*) Reserve series—						
Pannangatteri (Odugathur Range).	156	27 0	425	13 0	272	22 0
Kallaparai (Odugathur Range).	100 21	8 0 8 0	105	7 0	107	8 0
Jambumalai (Polur Range).	64	8 0	70	27 0	73	53 0
Ponniar, West (Tiruvannamalai Range).	79 79	7 0 7 0	105	12 0	94	12 0

Statement showing the prices obtained for fuel in special coupes not prescribed by the working plans from 1941–42 *to* 1947–48.

Name of special coupe.	1941–42.		1942–43.		1943–44.		1944–45.	
	Area of coupe.	*Price per acre.*	*Area of coupe.*	*Price per acre.*	*Area of coupe.*	*Price per acre.*	*Area of coupe.*	*Price per acre.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.
Odugathur Range.								
Munukkal	..	..	..	..	202	10 0	196	12 0
Special area in Vellakal Reserved Forest	..	..	..	..	..	..	97	22 0
Special area in Ambur Reserved Forest	..	..	..	..	..	..	46 50	20 0 25 0
Do.	..	..	..	..	..	..	..	..
Kallaparai Special	..	..	..	..	..	..	..	..
Karuthamalai Reserved Forest Special	..	..	..	..	..	..	..	..
Santhavasal Range.								
Malayalam	49	8 4	49	8 4	120½	5 8	108	20 0
Polur Range.								
Thaniar West Special	..	..	..	..	46	7 0	..	..
Gillman Special	131	7 8	131	7 8	80	10 4	100	20 4
Tiruvannamalai Range.								
Veppur	116	4 0	116	4 0	95	5 0	92	3 4
Reddipalayam	..	..	..	..	..	..	..	..
Rayandapuram Special Coupes ..	..	..	..	..	..	..	..	..

Name of special coupe.	1945–46.		1946–47.		1947–48.	
	Area of coupe.	*Price per acre.*	*Area of coupe.*	*Price per acre.*	*Area of coupe.*	*Price per acre.*
	(10)	(11)	(12)	(13)	(14)	(15)
Odugathur Range—cont.						
	ACS.	RS. A.	ACS.	RS. A.	ACS.	RS. A.
Munukkal	170	105 1	145	10 0	230	30 0
Special area in Vellakal Reserved Forest.	93 83	26 0 83 11	119	4 0	188	12 8
Special area in Ambur Reserved Forest.	20	30 0	203 250	4 0 5 0	190	6 8
Do.	275 200 84	10 0 11 0 10 0	75 75	7 0 8 0	..	..
Kallaparai Special	100	8 0	112	9 4	310	40 0
Karuthamalai Reserved Forest Special	..	..	..	..	275 293	34 0 38 0
Santhavasal Range—cont.						
Malayalam	170	32 8	105	35 0	114	126 0
Polur Range—cont.						
Thaniar West Special	128	26 0	..	..	..	..
Gillman Special	139	13 0	308	28 0	344	31 0
Tiruvannamalai Range—cont.						
Veppur	205	4 0	108	10 0	116	20 0
Reddipalayalam	..	..	..	..	144	16 0
Rayandapuram Special coupes ..	98	9 0	178	14 0	225	40 0

Paragraph 126.

Statement showing the prices obtained in rupees for the minor forest produce, 1936–37 *to* 1947–48.

	1936–37.					1937–38.				
Items.	*Vellore.*	*Odugathur.*	*Santhavasal.*	*Polur.*	*Tiruvannamalai.*	*Vellore.*	*Odugathur.*	*Santhavasal.*	*Polur.*	*Tiruvannamalai.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Stones	6,065	..	..	..	..	..	4,000	..	..	..
Other minor forest produce.	919	515	1,442	1,370	500	963	810	1,400	1,646	520
Avaram bark	..	330	..	..	1,210	..	200	..	180	1,210
Surul bark	..	..	..	..	21	..	..	..	..	26
Manure leaves	..	..	..	..	..	55	475	80	55	65
Nux vomica	..	..	..	..	..	..	..	..	60	36
Konnai bark	..	..	..	..	..	..	..	..	..	145

	1938–39.					1939–40.				
Items.	*Vellore.*	*Odugathur.*	*Santhavasal.*	*Polur.*	*Tiruvannamalai.*	*Vellore.*	*Odugathur.*	*Santhavasal.*	*Polur.*	*Tiruvannamalai.*
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Stones	..	..	..	..	..	..	..	..	..	..
Other minor forest produce.	679	495	1,386	1,345	525	671	915	1,243	1,167	860
Avaram bark	..	200	..	..	..	..	200	101	..	620
Surul bark	..	..	..	..	26	..	..	..	..	26
Manure leaves	140	290	85	150	85	135	530	111	121	80
Nux vomica	..	..	..	..	37	..	..	..	..	37
Konnai bark	..	..	..	105	..	100	151	201	..	..

	1940–41.					1941–42.				
Items.	*Vellore.*	*Odugathur.*	*Santhavasal.*	*Polur.*	*Tiruvannamalai.*	*Vellore.*	*Odugathur.*	*Santhavasal.*	*Polur.*	*Tiruvannamalai.*
	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)
Stores	4,025	..	..	..	..	90	..	..	..	..
Other minor forest produce.	743	390	1,260	1,835	480	824	341	875	1,282	683
Avaram bark	..	215	..	..	..	..	..	..	70	..
Surul bark	..	..	..	..	20	..	..	..	15	..
Manure leaves	79	660	287	251	50	175	673	280	210	55
Nux vomica	..	15	25	80	80	..	..	..	..	..
Konnai bark	..	..	..	..	..	..	..	..	..	..

Statement showing the prices obtained in rupees for the minor forest produce, 1936–37 to 1947–48.

Items.	1942–43.					1943–44.				
	Vellore. (32)	*Odugathur.* (33)	*Santhavasal.* (34)	*Polur.* (35)	*Tiruvannamalai.* (36)	*Vellore.* (37)	*Odugathur.* (38)	*Santhavasal.* (39)	*Polur.* (40)	*Tiruvannamalai.* (41)
Stones	50	..	..	..	..	7,510	..	280	..	..
Other minor forest produce.	959	680	660	1,449	555	3,624	1,115	3,685	4,050	1,227
Avaram bark ..	52	..	..	..	..	61	..	600	..	450
Surul bark	..	..	..	..	11	..	105	205	50	19
Manure leaves ..	590	563½	408	157	87½	444	154	316	22	24
Nux vomica ..	..	..	..	..	10	..	..	..	..	16
Konnai bark ..	..	..	..	..	70	..	..	..	1,500	..

Items.	1944–45.					1945–46.				
	Vellore. (42)	*Odugathur.* (43)	*Santhavasal.* (44)	*Polur.* (45)	*Tiruvannamalai.* (46)	*Vellore.* (47)	*Odugathur.* (48)	*Santhavasal.* (49)	*Polur.* (50)	*Tiruvannamalai.* (51)
Stones	250	..	..	..	..	..	..	..	..	..
Other minor forest produce.	3,033	515	2,292	3,902	2,662	3,177	1,115	5,205	2,040	2,465
Avaram bark ..	60	350	..	55	..	..	..	..	..	..
Surul bark	..	..	..	17	19	25	..	..	21	..
Manure leaves ..	611	68½	116	25	102	623	88	106	33	67
Nux vomica ..	..	..	..	..	121	..	..	..	..	55
Konnai bark ..	56	95	51	..	..	..	..	..	..	..

Items.	1946–47.					1947–48.				
	Vellore. (52)	*Odugathur.* (53)	*Santhavasal.* (54)	*Polur.* (55)	*Tiruvannamalai.* (56)	*Vellore.* (57)	*Odugathur.* (58)	*Santhavasal.* (59)	*Polur.* (60)	*Tiruvannamalai.* (61)
Stones	3,500	..	125	..	..	..	..	..	..	..
Other minor forest produce.	3,432	1,215	4,560	2,062	2,760	4,446	400	4,460	2,080	2,950
Avaram bark ..	..	..	..	..	550	180	810	..	..	..
Surul bark	..	..	..	..	50	..	..	..	..	..
Manure leaves ..	313	131	22	102	37	230	..	..	40	25
Nux vomica ..	..	..	..	..	100	..	..	..	..	95
Konnai bark ..	..	..	..	..	..	..	..	..	..	800

CHAPTER IV—STAFF AND LABOUR SUPPLY.

127. *Staff, administrative, executive and protective.*—The administrative staff consists of one District Forest Officer, who is either a Deputy Conservator of Forest, or an Assistant Conservator of Forests. Details of the executive and protective staff, as it stands at present, is given in the following statement :—

Range.	Permanent establishment.			Temporary establishment.		
	Rangers.	Foresters.	Forest guards.	Foresters.	Forest guards.	Forest watchers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Vellore	1	3	13	2	4	8
Odugathur	1	2	12	..	..	12
Santavasal	1	4	8	..	1	9
Polur	1	4	10	..	1	9
Tiruvannamalai	1	1	9	..	1	9
	5	14	52	2	7	47

128. *Staff, clerical—*

(*a*) *District Forest Office—*

Head Clerk	1
Accountant	1
Routine clerks	5
Draftsman	1
Typist	1
Firewood writer	1 (temporary) paid under X. B. b.
Peons	4 (one temporary).

(*b*) *Range offices—*

Range.	Range clerks.		Range peons.		Remarks.
	Permanent.	Temporary.	Permanent.	Temporary.	
(1)	(2)	(3)	(4)	(5)	(6)
Vellore	1	..	1	..	NOTE.—The temporary clerk of Santavasal range is now working at Vellore range.
Odugathur	1	..	1	..	
Santavasal	1	1	1	1	
Polur	2	..	2	..	
Tiruvannamalai	1	..	1	..	

129. *Labour supply.*—In the plains, labour, though not plentiful, is adequate. In the Javadis, the Malayalees constitute the entire labour force and under the terms of the 'Forest Village System' are bound to supply labour when called upon to do so—vide paragraph 39 (*c*) above. Hitherto, no serious difficulty has been experienced in obtaining the requirements of the department.

130. A list of forest villages on the Javadi plateau is given in column 1 of the statement in paragraph 260 below.

CHAPTER V—PAST SYSTEMS OF MANAGEMENT.

SECTION 1—GENERAL HISTORY OF THE FOREST.

131. *Introduction.*—The acquisition of the North Arcot district by the East India Company was completed on the 31st of July 1801, when Azim-ul-Umara, uncle and successor of the last Nabob of the Carnatic, handed over to the company the whole of his civil and military authority and accepted in return a stipendiary allowance of one-fifth of its estimated revenue for the support of himself and his family.

132. *Period prior to the passing of the Madras Forest Act in* 1882.—The following extracts from Chapter XI, Volume II, of the 'Madras District Manuals', North Arcot, describe briefly the administration of the forests from the time they came under British control to the passing of the 'Madras Forest Act' in 1882, when matters were put on a regular footing and systematic reservation commenced.

133. For long after the assumption of the district by the British, no systematic control of the forests was attempted. Until 1844, the only tax upon timber was that collected as land customs by the Sayer (duties on imports and goods in transit) officials. When land customs were abolished, felling greatly increased, and became so indiscriminate that in 1846 the Collector, Mr. Lovell, directed that all jungles should be taken charge of by tahsildars and that no tree should be felled without their permission, which should only be given for such trees as the monigar of the village pronounced fit to be felled. A small tax was at

the same time levied, but it was too low to keep the jungles from being recklessly thinned. The charge for instance, for a cartload of red sanders wood was only Re. 1, while in Cuddapah it was Rs. 6. The natural result was that red sanders almost disappeared, and that the Tirupati forests, in which alone it grew, were handed over to the Deputy Conservator of the Cuddapah district in 1861.

134. In the following year, Mr. J. D. Robinson, the Collector, brought conservancy rules for the first time into operation, fixing new rates of seigniorage, and adopting what he styled the "Monigar Ranger and Yanadigilly" system. Village monigars collected the seigniorage, and retained 20 per cent of the receipts as the remuneration for themselves and their watchers.

135. In 1863, the Board of Revenue proposed that the Vellore and Polur jungles should be placed under a Deputy Conservator, as the Sub-Collector, Mr. Barlow, had no faith in village conservancy, and was convinced that many saplings were destroyed. Mr. Robinson strongly opposed the measure; but in 1865 the Thellay and Arasambattu jungles were transferred to the Forest department, and all the rest of the Vellore and Polur forests followed two years later. Previous to this, most of the best trees had been carried away for use upon the railway, while Mr. Sullivan was Sub-Collector and entrusted with the supply of sleepers to the company. The forests have not yet recovered from the terrible drain then imposed upon them.

136. *Period subsequent to the passing of the Madras Forest Act in* 1882.—Striking progress in the reservation of areas marked the commencement of this period. In 1884, three reserves, Ambur (including the fuel reserve and the plantation), Senur and Karnatigiri, aggregating 12,860 acres, were constituted reserved forests under section 16 of the Act. Further reservations proceeded briskly, until in 1898 the total area of reserves amounted to 324,291 acres. By this time, all the major reservations had been completed.

137. *Administrative changes.*—From 1865 to 1911, the North Arcot forest district corresponded in area and boundaries with the North Arcot revenue district and also had its headquarters at Chittoor. When the revenue district was bifurcated in 1911 into the North Arcot and Chittoor districts, the forest district was also bifurcated and similarly designated. The headquarters of the two forest districts were at Vellore and Chittoor. At the same time, the Tiruvannamalai range was transferred to the North Arcot forest district from South Arcot. Later in the same year 1911, the North Arcot district forest was further bifurcated into the North and South Vellore forest divisions, with the headquarters of both divisions at Vellore (G.O. No. 3387, Revenue, dated 13th November 1911).

138. On the 1st of April 1917, the South Vellore Division was again further bifurcated into the South and West Vellore Divisions, with headquarters at Vellore and Tiruppattur, respectively, and the Pavanjiput reserve was transferred from the South Arcot forest district to the new South Vellore forest division (G.O. No. 1131, Revenue, dated 18th May 1916).

139. On the 1st of July 1920, the Gingee Range was transferred from the East Salem Division to South Vellore (G.O. No. 929, dated 4th May 1920) and, consequent upon the transfer of a large number of reserves to panchayat management, was amalgamated with the Tiruvannamalai Range on the 1st of September 1925 (IV Circle Conservator's D. Dis. No. 819/25-M, dated 11th August 1925).

140. The Chingleput Division, which was abolished on the 1st of May 1925, was, with the exception of the Sathivedu Range, amalgamated with the North Vellore Division (G.O. Ms. No. 746, Development, dated 19th May 1925). This amalgamation did not involve any increase in the area of reserved forests administered by the Forest department as the reserves of the Chingleput Division excluding a few in the Sathivedu Range, had already been handed over to panchayat management. The only extra work involved by the amalgamation was the adjustment of petty items of revenue realized by the Revenue department in the five taluks of Chingleput Division.

141. On the 16th of July 1926, owing to the transfer of a large number of reserves to panchayat management, and also for financial reasons, the North, South and West Vellore Divisions were amalgamated into one division with its headquarters at Vellore (G.O. Ms. No. 789, Development, dated 31st May 1926). At the same time, the Krishnagiri and Gudiyattam ranges of the West and North Vellore Divisions, respectively, were transferred to North Salem and Chittoor. The single division continued for about six-and-half years during which period it became evident that the division was unwieldy and too much for one District Forest Officer to administer.

142. Consequently, on the 1st of December 1932, the Vellore Division was bifurcated into the East and West Vellore Divisions, with headquarters at Vellore and Tiruppattur,

respectively (G.O. Ms. No. 1537, Development, dated 29th November 1932). The Krishnagiri Range was transferred to West Vellore with effect from the 1st of June 1933 (G.O. Ms. No. 489, Development, dated 27th April 1933), but the Gudiyattam Range remained a part of the Chittoor Division.

The new Chingleput Forest Division was constituted from 16th July 1946 and the boundaries have not yet been changed. A revised notification has been sent by the District Forest Officer, Vellore East, and the Government Order on the subject is awaited. However, the bifurcation does not involve any change in the area of the reserved forest under departmental control of Vellore East Division.

In 1946–47 (vide G.O. Ms. No. 2995, Development, dated 5th August 1946), Allialamangalam Panchayat Forest (7,597 acres in extent) and Vallimalai Panchayat Forest (2,009·2 acres in extent) were taken over by the Forest department and added on to Polur and Santavasal Ranges, respectively.

143. *Working plans.*—The original survey of the forests of the North Arcot Division was completed in 1899. The first working plan was written by Mr. H. B. Bryant in 1901 and included the Sanankuppam, Ambur and Ambur fuel reserves, aggregating 52,211 acres. Following this, several other working plans were written, each either covering a group of reserves or prescribing for the exploitation of one or more particular products. The following statement gives a list of working plans prepared and sanctioned up to the present :—

Paragraph 144.

Serial number and working plan for (1)	*Sanctioned in* (2)	*Reserve.* (3)	*Area covered.* (4)	*Produce.* (5)
			ACS.	
1 The Ambur Forests, by H. B. Bryant.	B.P. Forest No. 251, dated 15th July 1901.	Shanankuppam, Ambur and Ambur fuel.	52,211	Timber, fuel and minor forest produce.
2 Do.	B.P. Forest No. 17, dated 9th January 1902, amended in B.P. Forest No. 265, dated 18th September 1902.	Do.	52,211	Bamboos.
3 The Tiruvannamalai Forests, by C. H. Maduranayagam Pillai.	B.P. Forest No. 155, dated 22nd May 1902.	Perungolathur, Swamimalai, Valasamalai, Nattampalli and Ponniar (part).	45,767	Small timber fuel, manure leaves and grazing.
4 The Galamalai and Asanampet hills and Shanankuppam reserve, by V. S. Gurunatha Pillai (supplemental to No. 1 above).	B.P. Forest No. 146, dated 26th July 1904.	Shanankuppam and Ambur.	25,435	All produce except sandal and bamboos.
5 * The Vellore Forests, by V. S. Gurunatha Pillai.	B.P. Forest No. 223, dated 8th November 1904 ; B.P. Routine No. 501, dated 22nd June 1915.	Athiyur, Nellimalai, Kylasagiri, Appukkallu, Karuthamalai, Arasampattu, Thellai, Puthur and Veerappanur.	85,784	All produce except sandal.
6 * The Polur Range, by V. S. Gurunatha Pillai (now the Polur and Santavasal ranges).	1905 (The B.P. number and date are not forthcoming).	Puthur, Thellai, Veerappanur, Malayalam, Karnatigur, Patrakad, Santavasal, Mulakad and Periamalai.	135,712	All produce.
7 * The Polur Range, by J. S. Battie (revision of No. 6 above).	B.P. Forest No. 202, dated 14th October 1907, amended in B.P. Routine No. 501, dated 22nd June 1915.	Do.	135,712	Do.
8 * The East Vellore Range by V. S. Gurunatha Pillai.	B.P. Forest No. 20, dated 20th January 1910.	Banavaram	1,210	Fodder grass (removals by Military Grass Farms only).
9 * The Javadi and Yelagiri Hills, by C. C. Wilson.	B.P. Forest No. 172, dated 13th December 1915.	Veerappanur, Mulakad, Patrakad, Malayalam, Puthur, Arasampet and Thellai.	55,447	Sandalwood.
10 The Palar Riverside Plantations, by T. N. Hersey.	B.P. Forest No. 107, dated 13th July 1916.	Virinjipuram, Vikramanchi, Ammundi, Chenur, Kilminal, Tiruvallam and Vannivedu.	1,388	Small timber fuel and fodder grass.

* These working plans also included a number of reserves which are now situated in other divisions, or have either been disafforested or handed over to panchayat management.

Serial number and working plan for (1)	*Sanctioned in* (2)	*Reserve.* (3)	*Area covered.* (4)	*Produce.* (5)
			ACS.	
11 South Vellore, by K. R. Venkataramana Ayyar.	C.C.P. No. 3, dated 22nd January 1920.	Arasampattu, Puthur, Thellai, Malayalam, Santavasal, Veerappanur, Patrakad, Mulakad, Valasamalai, Nattampalli and Perungolathur-Swamimalai.	105,932	Bamboos and minor forest produce.
12 * South Vellore, by H. W. A. Gaudoin.	C.C.P. No. 114, dated 6th May 1925.	All reserves in the Polur, Santavasal and Tiruvannamalai ranges.	307,016	All produce except sandal.
13 Vellore East, by A. R. Brand.	C.C.P. No. 211, dated 13th April 1938.	All reserves in Odugathur, Vellore, Santavasal, Polur and Tiruvannamalai ranges.	4,318,720	All produce.

* These working plans also included a number of reserves which are now situated in other divisions, or have either been disafforested or handed over to panchayat management.

SECTION 2—PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS.

Sandal.

(*a*) Prior to Mr. C. C. Wilson's Plan.

145. There is no record of any sandal operations in these forests prior to 1900. During the years 1900 to 1903, a sum of Rs. 800 was realized by the sale of sandalwood extracted departmentally. The first working plan relating to sandal was written by Mr. V. S. Gurunatha Pillai in 1905 and revised by Mr. J. S. Batty in 1907 in as far as it regulated to Javadis of the North Arcot district. The plan prescribed for the extraction in the Polur and Santavasal Ranges (the then Polur Range) of such trees as were dead or dying or were of a minimum girth of 36 inches at 4 feet from the ground. Little or no attention was paid to cultural operations and regeneration. These prescriptions remained in force until Mr. C. C. Wilson's Working Plan for the Javadi and Yelagiri Hills, according to which work is at present regulated, came into operation in 1915. In the Odugathur and Tiruvannamalai ranges sandal occurs either scattered or in small patches and up to a few years ago was not considered sufficiently important to justify systematic working.

(*b*) Mr. C. C. Wilson's Plan.

146. The following paragraphs briefly set forth the more important prescriptions of Mr. Wilson's plan, the extent of their application and the results obtained.

147. *Method of treatment and subdivision of the area.*—As far as the present East Vellore Division is concerned, Mr. Wilson's Plan dealt with the Polur and Santavasal ranges only. It prescribed improvement felling involving the extraction of dead and dying trees on a six year felling cycle. The sandal bearing areas of each range, including poramboke and patta lands formed a working circle, which was divided into three felling series of six coupes each. In practice, this amounted to one working circle of six felling series as the method of treatment was the same in both ranges. Thus, six coupes were worked annually. Their size varied from 669 acres to 3,056 acres, depending on the density of the stocking. The following statement shows the subdivision of the area :—

Felling series.		*Coupes.*		
Name and composition. (1)	*Area.* (2)	*Number.* (3)	*Area.* (4)	*Year of felling.* (5)
	ACS.		ACS.	
Santavasal Range.				
Thongamalai—				
Thongamalai enclosure	3,667	I ..	1,627	1915–16. 1921–22. 1927–28.
Puthur Reserve Forest (part)	1,753	II ..	1,705	1916–17. 1922–23. 1928–29.
Arasampattu Reserve Forest	2,575	III ..	1,219	1917–18. 1923–24. 1929–30.
		IV ..	1,411	1918–19. 1924–25. 1930–31.
		V ..	904	1919–20. 1925–26. 1931–32.
		VI ..	1,129	1920–21. 1926–27. 1932–33.
Total ..	7,995		7,995	

Felling series. Name and composition. (1)	Felling series. Area. (2)	Coupes. Number. (3)	Coupes. Area. (4)	Coupes. Year of felling. (5)
Santavasal Range—cont.				
	ACS.		ACS.	
Amerdi—				
Telli Reserve Forest (part)	3,086	I ..	1,597	1915–16. 1921–22. 1927–28.
Puthur Reserve Forest	4,542	II ..	1,505	1916–17. 1922–23. 1928–29.
Amerdi plantation	26	III ..	1,770	1917–18. 1923–24. 1929–30.
		IV ..	848	1918–19. 1924–25. 1930–31.
		V ..	866	1919–20. 1925–26. 1931–32.
		VI ..	1,068	1920–21. 1926–27. 1932–33.
Total ..	7,654		7,654	
Nadanur—				
Puthur Reserve Forest (part)	7,413	I ..	882	1915–16. 1921–22. 1927–28.
Malayalam Reserve Forest	1,303	II	837	1916–17. 1922–23. 1928–29.
Tellai Reserve Forest (part)	122	III ..	1,585	1917–18. 1923–24. 1929–30.
		IV ..	2,284	1918–19. 1924–25. 1930–31.
		V ..	1,947	1919–20. 1925–26. 1931–32.
		VI ..	1,303	1920–21. 1926–27. 1932–33.
Total ..	8,838		8,838	
Polur Range.				
Veerappanur—				
Veerappanur Reserve Forest (part)	8,169	I ..	1,668	1915–16. 1921–22. 1927–28.
		II ..	948	1916–17. 1922–23. 1928–29.
		III ..	726	1917–18. 1923–24. 1929–30.
		IV ..	749	1918–19. 1924–25. 1930–31.
		V ..	2,208	1919–20. 1925–26. 1931–32.
		VI ..	1,870	1920–21. 1926–27. 1932–33.
Total ..	8,169		8,169	

Felling series.		Coupes.		
Name and composition.	Area.	Number.	Area.	Year of felling.
(1)	(2)	(3)	(4)	(5)
Polur Range—cont.				
	ACS.		ACS.	
Patrakad—				
Patrakad Reserve Forest	10,327	I ..	1,861	1915–16. 1921–22. 1927–28.
Mulakad Reserve Forest	1,625	II ..	1,947	1916–17. 1922–23. 1928–29.
		III ..	1,858	1917–18. 1923–24. 1929–30.
		IV ..	2,481	1918–19. 1924–25. 1930–31.
		V ..	2,413	1919–20. 1925–26. 1931–32.
		VI ..	1,392	1920–21. 1926–27. 1932–33.
Total ..	11,952		11,952	
Komattiyur—				
Komattiyur enclosure	5,781	I ..	3,056	1915–16. 1921–22. 1927–28.
Veerappanur Reserve Forest (part)	5,058	II	2,689	1916–17. 1922–23. 1928–29.
		III ..	1,436	1917–18. 1923–24. 1929–30.
		IV ..	669	1918–19. 1924–25. 1930–31.
		V ..	1,828	1919–20. 1925–26. 1931–32.
		VI ..	1,161	1920–21. 1926–27. 1932–33.
Total ..	10,839		10,839	

148. Fellings were prescribed for three cycles covering a period of 18 years, 1915–16 to 1932–33. In 1917–18, no felling was done as extraction was confined to a number of trees which were blown over in a severe cyclone in the previous year. Thus the third cycle of the plan was not completed until 1933–34. During 1934–35 and 1935–36, fellings were continued in coupes I and II of each series in accordance with the prescriptions, pending revision of the plan.

149. *Extraction.*—It was prescribed that dead trees were to be removed in the year of felling, and dying trees girdled and left to die and dry for two years before being extracted. That part of the prescription relating to girdling was not sanctioned and the extraction of dying trees was discontinued from 1928–29 under the orders of the Chief Conservator of Forests in accordance with Resolution III of the Proceedings of the Conservators' Conference held in June 1927 (C.C.P. No. 230 of 1927, Press, dated 13th July 1927).

150. *Tending* was prescribed in each coupe in the year following that of felling and was carried out accordingly up to 1922. In 1922, during the tour of the Commissioner of Land Revenue and the Conservator of Forests, Salem Circle, in the Javadis, the "Malayalees" represented that they were too often disturbed in their agricultural pursuits by the frequent demands for labour made upon them by the Forest department for sandalwood operations. After due consideration, it was decided to carry out the tending simultaneously with the operation of marking and enumerating dead trees for extraction, i.e., tending was done in the year preceding that of felling. The deviation was sanctioned by the Chief Conservator of Forests in his Proceedings Routine No. 19, dated 10th January 1923.

151. The tending consisted of freeing crowns of sandal trees and their hosts from creepers, cutting down trees interfering with the free development of sandal and helping sandal saplings by cutting back growth interfering with them. A rate of six pies per acre was fixed for the operation, but in recent years, owing to financial stringency, it was considered necessary to halve this rate.

152. The Chief Conservator of Forests, in his Proceedings No. 262, dated 20th July 1929, reduced the tending cycle from six to three years. This deviation was however not put into practice again because of financial stringency, and tending has been done throughout as prescribed in the plan.

153. In addition to this general tending, it was prescribed that specially protected blocks from 25 to 100 acres in extent, and containing particularly promising growth of young sandal, were to be selected in each of the annual coupes and rigidly protected from fire and grazing. These specially protected blocks were to be tended and watched until the young sandal growth was out of danger of suppression. It was assumed that this tending would not continue for more than the length of the felling cycle. Unfortunately, except in a few cases, the selection of blocks was not done as the working plan intended. Areas containing well established sandal trees were unnecessarily fenced and protected and the tending done in them was in no way different to the general tending carried out over the whole area. Experience showed that it was difficult to find a block of the size prescribed in the plan, 25 to 100 acres, containing young growth throughout, and that the efficient fencing of a block of this size was an expensive business. In 1929, therefore, it was decided to limit the size of each block to 10 acres. (Chief Conservator of Forests, Reference No. 9151-C-2/29-1, dated 10th December 1929.) Later, owing to financial stringency, further selection and tending of these specially protected blocks was held in abeyance.

154. Under Regeneration it was prescribed that—

(i) immediately a coupe was felled, a cleaning should be done under all specially promising seed bearers, the soil raked up around them and all seedlings freed from interfering growth.

(ii) Sowings were to be done in small blanks wherever they occurred.

(iii) Thereafter the coupe was to be gone over annually for the next three years and young sandal kept clear of overhead and too much lateral shade.

155. Cleaning under specially promising seed bearers appears to have been done until 1922, but there is no record to show the extent to which this prescription was carried out. Writing in 1921, Mr. H. A. Latham, Conservator of Forests, records: "Fencing mother trees is to be stopped as, so far, practically no results have been seen which justify the labour involved." Again, in 1922, Mr. Latham records. "Mother trees are a waste of labour." From this date the prescription was discontinued, although no sanction seems to have been obtained for the deviation.

156. Sowing in blanks was done annually until 1922. From 1922 to 1927 no sowing was done. The reason for this is not known, but it is probable that the operation was discontinued along with the cleaning under specially promising seed bearers. In 1927 it was ordered that each subordinate should produce at least one acre of established sandal in his beat annually and from that year no expenditure was incurred on the operation. Unfortunately the blanks which were sown were not marked and it is impossible at this stage to comment on the results obtained. The control journals indicate that sowing done by subordinates, after 1927, was generally unsuccessful. The following statement shows the areas gone over each year. The areas of the blanks have not been recorded.

Year. (1)	*Area gone over.* (2) ACS.	*Locality.* (3)	*Cost.* (4) RS. A. P.
		Santavasal Range.	
1916–17	995	Coupe I, each series	46 0 0
	81	Coupe II, Thongamalai series	
1917–18	3,770	Not known	Not known.
1918–19	2,565	Coupes I to III, each series	83 13 0
1919–20	3,831	Not known	62 11 3
1920–21	2,159	Not known	33 10 0
1921–22	670	Not known	20 15 0
		NOTE.—From 1927–28 no expenditure was incurred.	
1927–28	..	Nil	..
1928–29	265	* S.P.Bs. in coupes I to VI Thongamalai series	..
	240	S.P.Bs. in coupes I to VI Amerdi series	..
	224	Coupes I to VI Nadanur series including S.P.Bs.	..
1929–30	1,100	Copues I, II and VI, Thongamalai series including S.P.Bs.	..
	107	Coupes I, II and VI Amerdi series including S.P.Bs.	..
	110	Coupes I to VI, Nadanur series including S.P.Bs.	..
1930–31	672·4	Coupes I to VI Thongamalai series including S.P.Bs.	..
	231	Coupes I to VI, Amerdi series including S.P.Bs.	..
	337	Coupes I to VI, Nadanur series including S.P.Bs.	..

* S.P.B.=Specially Protected Block (paragraph 37 of Mr. Wilson's Sandalwood Working Plan).

Year. (1)	*Area gone over.* (2)	*Locality.* (3)	*Cost.* (4)
		Santavasal Range—cont.	
	ACS.		RS. A. P.
1931–32	1,888	Coupes I to VI, Thongamalai series including S.P.Bs. ..	..
	211·4	Coupes III to V, Amerdi series including S.P.Bs.	..
	214	Coupes I to VI, Nadanur series including S.P.Bs.	..
1932–33	Not known (2,455 patches).	Coupes I to VI, Thongamalai series, including S.P.Bs. ..	..
	Not known (3,000 patches).	Coupes I to VI, Amerdi series including S.P.Bs.	..
	Not known.	Coupes I to VI, Nadanur series, including S.P.Bs. ..	..
1933–34	Not known (2,400 patches † 3 acres).	Coupes I to VI, Thongamalai series including S.P.Bs. ..	..
	Not known (2,400 patches † 1 acre).	Coupes I to VI, Amerdi series including S.P.Bs.	..
	Not known (600 patches † 2 acres).	Coupes IV and V, Nadanur series including S.P.Bs. ..	..
		Polur range.	
1916–17	3,166 634	Coupe I, each series .. .. Coupe II, each series	150 0 0
1917–18	Nil	Nil	Nil.
1918–19	1,396	Coupes I to III, each series	* 10 6 0
1919–20	Not known.	† S.P.Bs. in coupes I to III each series	*Nil.
1920–21	1,354	Coupes III to V, each series	20 8 6
1921–22	3,445	Coupes IV to VI, each series	* 98 4 6
		NOTE.—From 1927–28 no expenditure was incurred.	
1927–28	Not known.	S.P.Bs. in Veerappanur, Patrakad and Komattiyur series.	..
1928–29	102 60 142	S.P.Bs. in coupes I to VI Komattiyur series .. .. S.P.Bs. in coupes I to V Patrakad series .. .. .. S.P.Bs. in coupes I to VI Veerappanur series	.. .. ..
1929–30	170 213 188	S.P.Bs. in coupes I to VI, Veerappanur series .. .. S.P.Bs. in coupes I to VI, Patrakad series .. .. .. S.P.Bs. in coupes I to VI Komattiyur series	.. .. ..
1930–31	70 31 80	S.P.Bs. in Veerappanur series .. .. S.P.Bs. in Patrakad series .. .. S.P.Bs. in Komattiyur series	.. .. ..
1931–32	30 35 38	S.P.Bs. in Veerappanur series .. .. S.P.Bs. in Patrakad series .. .. S.P.Bs. in Komattiyur series	.. .. ..
1932–33	..	Not recorded.	
1933–34	7 2,422	Regeneration plots in coupe III, Veerappanur series. .. Coupe V, S.P.B's and regeneration plots in coupe III, Patrakad series.	..
	3,540	Coupe, I, Komattiyur series	..

* All or some of the work done free of cost.

† S.P.B.—Specially Protected Block (paragraph 37 of Mr. Wilson's Sandalwood Working Plan).

157. In addition to the above, sandal seed was sown in patches under shrubs and along stream banks in the undermentioned localities outside the Sandalwood Working Plan area. Here again patches were not marked and it is not possible to state what the results are, except in the cases of the Thaniar and Nadanur rest-house compounds where the sandal has established itself. At Nadanur, however, there is a serious deficiency of hosts.

	Santavasal Range.		*Polur Range.*	
Year. (1)	*Area gone through.* (2)	*Locality.* (3)	*Area gone through.* (4)	*Locality.* (5)
1927–28 ..	4	Attuparai fuel series coupe III. Santavasal fuel series coupe IV. Karnatigur fuel series coupes I and III.	Not recorded.	Worked fuel coupes and Thaniar rest-house compound.
1928–29 ..	80 120 2	Arasampet Reserve. Malayalam Reserve. Nadanur rest-house compound.	16	Moolakad Reserve. Pullimedu fuel series, coupe I. Thaniar fuel series, coupe V.
1929–30 ..	Nil	..	13	Veerappanur Reserve.
1933–34 ..	Not recorded.	Nadanur-rest house. compound	Nil.	

The more important results achieved by Mr. Wilson's Working Plan was summarised under three heads by Mr. A. R. Brand, who says as follows :—

(i) " A very considerable increase in the area of the sandal forest, which, it is not unreasonable to assume, is due to an increase in the number of seed bearers in the higher girth classes, brought about by the discontinuance of the extraction of healthy trees of 36 inches in girth and over. That mature trees were markedly deficient when Mr. Wilson carried out his enumeration in 1915 is evident from the fact that over an area of 53,547 acres, only 1,945 trees (an average of one tree for every 28 acres) of 36 inches in girth and over were measured. Again, in paragraph 30 of his plan Mr. Wilson records : " When Mr. Rama Rao prepared his preliminary working plan for Tiruppattur Range, then in Salem district (now in the West Vellore Division) he raised the minimum felling girth by six inches and clearly proved when he did so that the lower girth at which felling had taken place previous to the preparation of his plan had resulted in considerable loss of revenue. From a perusal of his remarks on the subject it is evident that he was not at all confident that even his higher minimum would be sufficient, and this is without doubt the case, though what the correct figure may be we are not in a position to say even now owing to the lack of mature trees in the forest already referred to."

A complete enumeration of the sandal bearing areas carried out during 1934 and 1935 shows that the species has extended 23·4 per cent by area, since 1915.

" (ii) The establishment of systematic working whereby the whole of the sandal bearing area of the division is gone over once in six years and all dead trees extracted before they depreciate in value or are lost sight of."

" (iii) The production of a ' Sandalwood Register ' in which the girth of every tree extracted is recorded with its corresponding yield of heartwood. This register serves the purpose of showing definitely that there is no relation whatsoever between the girth of a sandalwood tree and the quantity of heartwood it yields, hitherto a doubtful point in some quarters."

(c) Mr. A. R. Brand's Plan.

158. The following paragraphs briefly set forth the more important descriptions of Mr. Brand's Plan, the extent of their application and results obtained—

(a) *Constitution and subdivision of the area.*—The Sandal Working Circle according to Mr. Brand's Plan, embraces an area of 113,068 acres of which 59,056 acres are from the sandal bearing areas in the reserves of the division and 24,012 acres are from the sandal bearing enclosures on the Javadi hills in the Vellore, Santavasal and Polur ranges and the unassessed lands and porambokes in the Akkarapatti village on the Kalroyan hills of the Tiruvannamalai range. The sandal in the reserves was stock-mapped by an adaptation of timber cruising method, which is explained in paragraph 227 below (Chapter VI, Part I). The area of 89,056 acres was divided into nine felling series and each of the felling series into six coupes, the coupes having been divided on an equiproductive basis with reference to density classes. The Silvicultural System adopted was a modification of the Selection System consisting of the removal of dead trees only and of the maintenance and improvement of the growing stock by rigid protection and tending operation. Enclosures to be examined annually or biennially (where the area is too large to be gone over in a year and dead trees removed promptly.

(b) *Fellings.*—It was prescribed that all operations connected with the exploitation would be carried out departmentally and that one coupe in each felling series and a definite sandal bearing enclosures be exploited annually. Extraction was confined to dead trees both standing and fallen including all stumps and roots. All green, fallen or broken stumps and branches also to be removed. Trees containing no heartwood not to be despatched to sale depot and no root containing heartwood of more than the size of half a rupee to be left on the ground. No restriction was imposed on the annual output as the exploitation was to be regulated by the area. Where coupe boundaries did not correspond with the natural or artificial boundaries, a ten feet wide line was prescribed to be cleared in the year preceding felling.

Extraction went on as per prescriptions, but in the year 1942 there was a deviation (as per Salem Circle Conservator's No. 3443/40-C., dated 15th September 1942) and all sandal trees in the spiked areas had to be extracted. So work was stopped in the regular coupe in that year. In the subsequent year two coupes were worked instead of one and thus the working was systematised as per prescriptions.

(c) *Yield.*—Mr. Brand pointed out that in Santavasal and Polur ranges, the mortality per cent was decreasing due to the more favourable conditions of growth induced by successful fire-protection and tending and that simultaneous with the decrease, the actual stocking had increased from 9·3 trees per acre in 1915 to 12·5 trees per acre in 1935. Hence he based the calculation of yield for the above two ranges by adopting the average annual yield for the last cycle. In the case of Vellore and Tiruvannamalai ranges, since extraction

commenced only in 1933–34 the average was based on the yields of three years only. The anticipated annual yield including enclosures given by Mr. Brand for the various ranges were as follows :—

	TONS.
(i) Santavasal and Polur Ranges	47·93
(ii) Vellore Range	1·24
(iii) Tiruvannamalai Range	0·51
Total for the division ..	49·68 or 50

Actual average annual yield calculated from the Control records from 1936–37 to 1946–47 are as follows :—

	Reserves. TONS.	Enclosures. TONS.
(i) Santavasal Range	14·58	4·50
(ii) Polur Range	19·47	8·75
(iii) Vellore Range	0·37	0·05
(iv) Tiruvannamalai Range	0·07	...
Total ..	34·49	13·30

Total for the division—47·79 or 48 tons.

N.B.—This does not include the yield obtained from miscellaneous sources as from spike trees, wind fallen trees and from trees extracted from Palar plantation while converting it into Casuarina plantation.

(*d*) *Tending.*—No general tending was prescribed by Mr. Brand. The only prescription was to cut creepers during marking for extraction.

Artificial regeneration was also not prescribed as it was found unnecessary.

(*e*) *Fire-protection.*—Mr. Brand prescribed that flowered bamboo areas, where sandal occurred and where there was risk from fire should be protected by a 30 feet wide line all round costing Rs. 15 a mile. Rs. 1,000 to be asked for every year until fire risk disappeared and the amount surrendered either in whole or in part, so soon as it was known what amount was actually needed. There seems to have been no expenditure on this score till 1938–39. Thereafter the expenditure incurred from 1938–39 is as follows :—

	RS.	A.	P.		RS.	A.	P.
1939–40 ..	384	2	0	1943–44 ..	169	1	0
1940–41 ..	156	14	0	1944–45 ..	302	4	0
1941–42 ..	226	6	0	1945–46 ..	255	11	0
1942–43 ..	198	1	0	1946–47 ..	314	4	0

(*f*) *Spike disease.*—At the time of Mr. Brand writing the working plan, he pointed out that the division was entirely free from spike and that only eight cases were discovered in the specially protected block near Patrakad rest-house. He pointed out that immediate detection and report of fresh attack was inevitable and that steps should be taken to isolate the infected tree by a 20 feet wide line to a belt of 10 to 100 yards depending on the severity of the attack. The following prescriptions were laid out:—

(*a*) Girdling all spiked sandal trees and painting the rings with Atlas solution.

(*b*) Lopping all apparently healthy sandal trees.

(*c*) Girdling all lopped trees, which subsequently exhibit symptoms and painting the rings with Atlas solution.

The heartwood of the dead trees to be exploited annually. He suggested that the above rules should be revised from time to time in consultation with the Provincial Silviculturist.

Spike trees were detected year after year from 1936–37 in Veerappanur, Patrakad and Mulakad sandal felling series inspite of prompt control measures. In 1941–42, all sandal trees in spike areas were girdled and killed by Atlas solution. Thereafter for two years no fresh spike was reported. In 1943–44, a fresh attack was noticed in another centre, i.e., in Veerappanur Reserved Forest near Jadayanur village and thereafter more trees every year in the same area. In 1945–46, spike was noticed in two more centres one

between 8/5 and 8/7 furlong stones on the Lushington road near Patrakad, and another in coupe I of Patrakad Sandal Felling Series. In 1946–47, spike was noticed in all these three centres. The total extent of spike areas up to the end of 1946–47 is 1,430·5 acres.

Details of spike operations carried out up to 1946–47—

1	Number of trees lopped up to 31st March 1947	25,824
2	Number of trees which manifested the disease	2,613
3	Number of trees that died without manifesting the disease ..	1,040
4	Number of trees extracted by the end of 1946–47	24,302
5	Cost of control operations at the end of 1946–47	RS. 1,872
6	Quantity of rough cleaned wood extracted till end of 1946–47 ..	489 tons 25 qrs.

In 1947, a fresh attack was noticed in another centre, i.e., to the north of Kattiapet village in Thongamalai Sandal Felling Series of Arasampet reserved forest of Santavasal range.

Extent of spike area—15 acres. So far 34 spike trees were detected and 680 healthy trees were lopped.

Timber.

159. A brief description of the manner in which timber was extracted prior to the passing of the Madras Forest Act in 1882 is to be found in paragraphs 132 to 135 above.

160. When the first working plan, for a part of the present Odugathur range, was written in 1901 the forest had already been drained of large timber for the supply of sleepers to the Madras Railway and the plan only contemplated the supply of small timber for agricultural purposes from fuel coupes worked on the simple coppice system on a 25-year rotation. In 1904, under the prescriptions of another plan, timber working circles were formed for practically the whole of the Odugathur range, the method of treatment being selection-*cum*-improvement on a 20-year felling cycle. All trees 4 feet and over in girth at breast height, all dead and dying trees and trees interfering with superior growth were extracted.

161. In the Santavasal, Polur and Tiruvannamalai ranges a small quantity of timber was worked departmentally in 1892. In 1897, contractors were allowed to fell marked trees and remove them on permits issued by Range Officers. Contracts for deadwood were also in force. In 1905 the first working circles were formed, the method of treatment being selection-*cum*-improvement as briefly described in the preceding paragraph.

162. Thus, by 1905, the so-called ‘ timber ’ forests were brought under the selection-*cum*-improvement system throughout the division, but the prescriptions practically remained a dead letter as the small quantity of timber which remained was so poor that it did not justify the adoption of a separate method of treatment and could be worked most conveniently along with fuel, as small timber for agricultural and domestic purposes, under the simple coppice system. Accordingly, in 1915, Mr. P. M. Lushington, Conservator of Forests of the then Southern Circle, addressed the Board of Revenue and had the prescriptions of all existing working plan cancelled in as far as they related to timber working circles. (B.P. Forest No. 664-Mis., dated 23rd October 1915.)

163. In 1925, Mr. H. W. A. Gaudoin in his working plan, prescribed a timber working circle of eleven felling series, three in each of the Santavasal and Polur ranges and five in Tiruvannamalai. Of these, one in Polur and three in Tiruvannamalai have since passed into panchayat control. The felling series comprised the steeper slopes of the Javadi and other hills, above the limits of the fuel felling series where the species are suitable for providing the ryots with small timber for agricultural and domestic purposes.

164. In each felling series a coupe, varying in size according to the demand and condition of the growth, but limited to one-ninth the area of the series, was to be laid out, with natural boundaries as far as possible, and worked each year. Ryots requiring timber for bona fide agricultural and domestic purposes were permitted to fell timber within the coupe of the year on specified days on payment to the Range Officer of a nominal rate fixed for each description of implement or building timber. Applications for their requirements were to be made by the ryots so as to reach the Range Officer during the first week of every month. Fellings were to be carried out in the presence of an officer not below the rank of Forester.

165. There is not a single instance on record where the ryots took advantage of the system. Their requirements were obtained from fuel coupes and by illicit removals.

166. Mr. Brand points out that at the time of his writing the working plan, the work in Odugathur range was being controlled by a tentative scheme which provided for the supply of small timber from fuel coupes. The system was simple coppice in the poorer areas and coppice with standards were the existing growth justified the retention of standards.

Bamboos.

(*a*) Prior to Mr. Brand's Working Plan.

167. The first bamboo working plan was written by Mr. H. B. Bryant in 1902. Before that date it was customary to lease out the right to remove bamboos from the whole forest annually, with the result that easily accessible areas were grossly overworked. Mr. Bryant's working plan dealt with a part of the present Odugathur range and prescribed rotation of three years. The rules regulating felling were practically the same as those in force to-day. In 1904 the remaining portion of the Odugathur range and parts of Santavasal and Polur were also brought under systematic working on a three-year rotation. The subdivision of the area into working circles, felling series and coupes was revised in 1907 and at about the same time the system of triennial leases was introduced.

168. In 1919 it became necessary to revise the then existing working plans because it was found that the stocking in the coupes bore no proportion to their areas and that the size of the coupes was unmanageably large. The revision with reference to the Santavasal, Polur and Tiruvannamalai ranges (the Odugathur range was then not a part of the East Vellore division) was done by Mr. K. R. Venkataramana Ayyar in his working plan (Chief Conservator's Proceedings No. 3, dated 22nd January 1920), which was subsequently incorporated in Mr. H. W. A. Gaudoin's working plan (Chief Conservator's Proceedings No. 114, Press, dated 6th May 1925), according to which work is at present regulated.

169. The old working plans for the bamboo areas of the Odugathur range were revised in a tentative scheme sanctioned by the Conservator of Forests, IV Circle, in his D. Dis. No. 624/25-C, dated 20th October 1925. This scheme was in force till Mr. Brand's plan came into force.

170. As regards the method of treatment and subdivision of the area Mr. Brand writes as follows :—

" As bamboo working in the division is regulated by two separate plans there are two working circles, one comprising the bamboo areas of the Santavasal, Polur and Tiruvannamalai ranges and the other these of the Odugathur range. The rotation in both working circles is three years and the felling rules are practically the same. The system of triennial leases has been continued."

171. The bamboo areas of the Santavasal, Polur and Tiruvannamalai ranges were divided into nine blocks, each of which is worked through one chief outlet. The blocks were divided into twenty-six felling series according to labour conditions and working facilities. In the Odugathur range eight felling series were prescribed : no blocks were formed. As far as possible coupe and series boundaries followed natural features. The following statement sets forth the subdivision of the area :—

Range.	*Name of block and area.*	*Felling series.*			
				Composition.	
		Name.	*Area.*	*Reserve.*	*Area.*
(1)	(2)	(3)	(4)	(5)	(6)
			ACS.		ACS.
Odugathur ..	.... ..	Athiyur	8,426	Kylasagiri	2,534
				Athiyur	4,738
				Arasampattu ..	1,154
		Thellai	10,656	Thellai	6,922
				Arasampattu ..	3,734
		Kottur	7,390	Do. ..	7,390
		Karuthamalai ..	16,320	Karuthamalai ..	16,320
		Asanampattu ..	8,568	Ambur	8,568
		Vellakkal	10,489	Do.	5,452
				Vellakal	5,037
		Panangatteri ..	5,221	Ambur	5,221
		Naikaneri	13,896	Do.	11,925
				Shanankuppam ..	1,971
Santavasal ..	Odugathur—16,283 acres.	Thongamalai ..	4,378	Thellai	1,514
				Puthur	2,864
		Nayakanur ..	4,360	Arasampattu ..	4,360
		Kudigam	3,489	Puthur	2,964
				Arasampattu ..	525
		Komiar	4,056	Do. ..	4,056
	Amerdi—13,598 acres ..	Nekkini	3,900	Thellai	3,268
				Puthur	632
		Sathampattu ..	2,945	Thellai	960
				Puthur	960
				Malayalam ..	1,025
		Kanamalai ..	1,803	Do. ..	1,803
		Nadanur	4,950	Puthur	4,421
				Malayalam ..	529
	Shenbakatope hill—7,831 acres.	Puliyamkuppam ..	3,989	Do. ..	3,989
		Benganur	3,842	Do. ..	3,842
	Shenbakatope plains—10,098 acres.	Shembakatope ..	6,118	Do. ..	6,118
		Santavasal ..	3,980	Santavasal	3,980

Range.	Name of block and area.	Felling series. Name.	Area.	Composition. Reserve.	Area.
(1)	(2)	(3)	(4)	(5)	(6)
			ACS.		ACS.
Polur ..	Arasampattu—12,566 acres.	Pudupattu	5,054	Veerappanur ..	3,206
				Arasampattu ..	1,848
		Veerappanur ..	4,607	Veerappanur ..	4,607
		Mandaparai ..	2,905	Do. ..	2,905
	Komattiyur—12,425 acres.	Palankottai ..	7,514	Do. ..	7,514
		Tekamarathur ..	2,416	Do. ..	2,416
		Motlapattu ..	2,495	Do. ..	2,495
	Chillimalai—9,150 acres ..	Odamangalam ..	3,810	Patrakad	3,810
		Kuttakarai ..	5,340	Do.	4,252
				Mulakad	1,088
	Nababupalayam—12,980 acres.	Kondikallur ..	5,362	Patrakad	2,210
				Mulakad	3,152
		Vedatope	2,880	Patrakad	2,880
		Pelavadi	4,738	Do.	4,738
Tiruvanna-malai.	Kalroyan—10,971 acres ..	Valasamalai ..	4,750	Valasamalai ..	4,750
		Nathampalli ..	3,595	Nathampalli ..	3,595
		Perungolathur-swamimalai.	2,626	Perungolathur-swamimalai.	2,626

172. The following five important felling rules were prescribed and the Malayalees (in the case of the Javadi hill reserves) made responsible, jointly with the lessee of each felling series, for seeing that they are strictly observed :—

(i) Felling should be confined to the coupe of the year.

(ii) The current years culms should not be cut.

(iii) The removal of 'picottah' bamboos (mature straight culms of *Dendrocalamus strictus* with the rizomes intact) for bona fide local consumption should be confined to an area of 100 acres in the coupe of the year in one felling series of each range under such restrictions as may be considered necessary by the District Forest Officer.

(iv) Culms should not be cut on the outside of the clump only, but should be removed in such a way that the culms left standing are evenly distributed.

(v) Culms should not be cut less than one foot or more than two feet from the ground.

173. As regards the results of past working Mr. Brand writes as follows :—

Results of past working reveal that the felling rules have been generally disregarded. Contractors and their agents seldom, if ever, enter the coupe. The rates paid to coolies for collection or so poor that it is almost impossible for a man to earn a living wage unless he goes to the forest nearest his village, irrespective of whether it lies in the year's coupe or not, and removes from it as many culms as he possibly can in the quickest and easiest manner. Consequently areas in the vicinity of villages have been grossly overworked. Whole clumps have been felled and culms, including those of the current year, cut at a height of anything from 4 to 15 feet from the ground. In addition to this most unsatisfactory state of affairs the Malayalees are responsible for the wholesale hacking of *Dendrocalamus strictus* for fodder, throughout the area, and for the removal of tender culms for basket-making.

174. As prescribed, the right to fell and remove bamboos in each block or felling series is being sold in auction on a triennial lease beginning with the 1st April in each period. In the Santavasal, Polur and Tiruvannamalai ranges the unit of sale is a block comprising two or more felling series, while in the Odugathur range each felling series is sold separately.

175. As stated in paragraph 167 above, the system of triennial leases was introduced in about 1907 and has been continued since. The system originated with the idea of helping contractors in the matter of organizing labour, in making and recovering advances to and from coolies and in the construction and improvement of extraction roads. Naturally the system commands better prices than annual sales would as, in addition to working facilities afforded them, contractors are more independent of market fluctuations and consequently in a position to bid higher prices.

176. Reversion to annual leases has been contemplated from time to time but not seriously considered. Breach of felling rules is seldom due to ignorance, but to a desire on the part of the individual coolie to remove bamboo by the easiest and quickest method in order to earn a living wage. As long as this condition continues it is very doubtful as to whether reversion to annual sales would set matters right, for we will still be faced with the difficulty of confining the activities of an underpaid and discontented labour force to the coupe of the

year by no means an easy task when one considers that the average size of a bamboo coupe is anything over 1,500 acres and that supervision of bamboo extraction is only one of the many duties of a forest guard.

Contractors have been filed for breach of felling rules from time to time and deductions have been made from refunds of grazing revenue to Malayalees. It is however evident that the action taken has had little or no effect on the offenders and the damage still continues.

(b) Mr. Brand's Working Plan.

177. (a) *General constitution and area.*—The bamboo working circle is 189,770 acres in extent and includes all areas in the division where bamboos are found in workable quantities. He did not make any alterations in the felling series nor coupes as they were prescribed after a careful scrutiny by Mr. K. R. Venkataramana Ayyar. Hence 34 felling series with a felling cycle of three years continued to exist. The felling cycle of three years was arrived at from the results obtained after a series of experiments conducted in accordance with Mr. K. R. Venkataramana Ayyar's working plan (1920) for the then South Vellore division (Chief Conservator's Proceedings No. 3, dated 22nd January 1920). Observations were made over a period of eight years and the results obtained are noted below :—

Method of treatment. (1)	*Experiment number.* (2)	*Felling cycle.* (3)	*Average number of culms produced every year.* (4)	*Total number of culms produced during the cycle.* (5)	*Number of new culms available for felling.* (6)	*Average annual yield per clump in culms.* (7)	*Remarks.* (8)
			A. General observations.				
Hundred per cent felling of culms over one year old.	1	Two years.	2	4	2	1	Harmful effect on clumps; many died after ten years. Culms of poor quality.
	2	Three years.	2	6	4	1·3	Culms better than experiment one and clumps healthier.
	3	Four years.	1·5	6	4·5	1·1	Clumps died early.
Fifty per cent thinning of culms over one year old on one side of clump.	4	Two years.	2	4	2/2=1	0·5	Culms long-lived and healthy. Clumps not much damaged.
	5	Three years.	4	12	8/2=4	1·3	Clumps healthy.
	6	Four years.	3	12	9/2=4·5	1·1	Do.
Fifty per cent thinning of culms over one year old evenly over the whole clump.	7	Two years.	4	8	4/2=2	1	Clumps not healthy.
	8	Three years.	4	12	8/2=4	1·3	Clumps healthy.
	9	Four years.	5	20	15/2=7·5	1·9	Do.

B. Longevity of culms—Life of culms.

Cycle. (1)	*Maximum.* (2)	*Minimum.* (3)
Two years	Twelve years	Four years.
Three years	Less than twelve years ..	Do.
Four years	Do. ..	Less than four years.

The following conclusions are drawn from the results recorded :—

Felling cycle.—It is seen that a two-year felling cycle is undesirable. The three-year cycle appear to give consistantly high yields under all the methods of treatment and it is interesting to note that in all cases the same outturn has been obtained under this cycle. Under the method of felling half the number of old culms, that is culms more than a year old, and leaving the remainder evenly distributed in the clump, the maximum outturn appears to be realized on a four-year cycle, but against this, the longevity of the culms shows that the minimum life of a culm on the four-year cycle is less than four-years, so that a proportion of the culms must be expected to be dead before they are felled. With a three-year cycle this would not be the case. It thus seems that, all things considered, a three-year cycle is the most suitable. A three-year felling cycle is therefore prescribed.

(b) *Flowering.*—Mr. Brand recorded that flowering commenced in June 1933 and was progressing slowly. He observed that *Bambusa arundinacea* was flowering more gregariously than *Dendrocalamus strictus.* Flowering of bamboos (both the species) were observed in various reserves of this division from 1936–37 to 1943–44. By the end of the hot weather

of 1943, the gregarious flowering of both the species of bamboos was completed. Natural regeneration was adequate and it was observed that *Bambusa arundinacea* had regenerated more satisfactorily than *Dendrocalamus strictus*. The latest record in 1945–46 showed that there has been only sporadic flowering of *Dendrocalamus strictus* in the Kalroyan bamboo block of Tiruvannamalai range.

The following rules prescribed were :—

(i) Current year's culms should not be felled,

(ii) minimum number of four mature culms should be left in each clump,

(iii) the height at which culms should be felled was 3 to 4 feet from ground level.

He prescribed that felling should be generally done through the agency of contractors, one coupe in each felling series being worked annually ; the District Forest Officer being given the option to sell bamboos departmentally when there was no competition in the sale or if he was convinced that there was an organized ring. There is no record of any departmental working being resorted to in the currency of Mr. Brand's plan.

(c) *Period of lease.*—Mr. Brand left the option to the District Forest Officer for adopting annual or triennial leases subject to the approval of the Conservator. In practice only triennial leases were continued from 1936–37.

To minimise the hacking of *Dendrocalamus strictus* by Malayalees for domestic purposes Mr. Brand prescribed that severe punitive measures should be taken against the Malayalees by cancelling either whole or in part the concession of free grazing in blocks where damage was bad. He also suggested that the graziers should be prohibited to carry bill-hooks into the reserves. To prevent over working by contractors he suggested imposition of heavy fines. There seems to have been no improvement in the matter and the damage still continues.

As a measure of transport facilities, Mr. Brand suggested the following roads :—

(i) Nadanur-Mandaparai to tap the eastern slopes of Veerappanur and Pudur reserves.

(ii) Chinnayampatti-Ulchekkidi road to tap the inner slopes of the Ulchekkidi valley in Nathampalli and Valasamalai reserved forests.

Item No. (i) was constructed while item No. (ii) was not taken up. He also prescribed that contractors should obtain District Forest Officer's approval before constructing new cart-tracks and that Range Officers should give the contractors all possible help in aligning suitable traces.

The Kuttakarai experimental felling series suggested by Mr. Brand was ruled out.

(d) *Grazing.*—No restriction was imposed.

(e) *Fire-protection.*—The protection of the working circle was included in the general scheme of fire protection.

Fuel.

(a) Earlier plans.

178. The only record of early working which can now be traced is to be found in the settlement records and relates to the Tiruvannamalai taluk, then a part of the South Arcot district. It is summarized in the two following paragraphs.

179. In 1830 a lease was granted by Government to Mr. Heath to cut and remove fuel for 21 years in the South Arcot district on payment of the following royalty :—

	RS.
First period of five years	Free.
Second period of five years	500
Third period of five years	1,000
Last six years	1,500

The lease expired in 1851.

180. In 1853 an iron company was formed, and a lease for thirty years was granted, giving the company exclusive right of mining iron-ore from the waste lands in several districts, South Arcot included. Operations commenced in the Tiruvannamalai taluk and a rate of five annas per cart-load was levied on the fuel consumed by the iron company. Most of the forests in the taluk, and certainly all those within a 15-mile radius of the town of Tiruvannamalai, were worked for this fuel supply. The operations of the company were virtually terminated in 1867 and the conservancy of Government lands was thenceforth maintained by the Forest department.

181. In the Odugathur, Santavasal and Polur ranges large areas appear to have been leased out annually, little or no attention being paid to silvicultural regulations.

182. The first working plans which prescribed systematic working were written by Mr. H. B. Bryant in 1901 for the Ambur, Chanankuppam, Ambur Fuel and Vellakal reserves of the Odugathur Range, aggregating 52,211 acres, and by Mr. C. H. Maduranayakam Pillai in 1902 for the reserves of the Tiruvannamalai Range. Both these plans prescribed simple coppice on a 25-year rotation, leaving standing a few trees which either afforded good shade or were valuable for the minor forest produce they yielded.

183. In paragraph 13 of his plan Mr. Bryant records " . . . (the forest) was open to any one who chose to come and cut; then it was supposed to be protected by village conservancy and during this period it was that the forest was almost entirely denuded of all its timber trees for sleepers for the Madras Railway, and subsequent to this it has been drained and drained for supplying the Madras Railway with engine fuel and too little regard has been paid to seeing that the fellings have been executed in accordance with silvicultural principles with the result that, instead of the growing stock improving in appearance after being felled over, it has very much deteriorated and a few more years at the present rate of fellings will necessitate a long period of rest before the forest can become legitimately ripe for the axe again. As stated already in the introduction, it can serve no useful purpose here to discuss the past methods of treatment. The appearance of the forest speaks for itself. It has undoubtedly been overworked and is being still with a view to supplying the Madras Railway with engine fuel. At the present rate of supply the forest has only sufficient for a few years more and it rests with the Conservator to decide whether the fellings shall continue to be so extensive as they are now or whether they shall at once be curtailed to the limit proposed in this working plan , . ."

184. In 1904, Mr. Gurunatha Pillai wrote a supplemental working plan for a further area of 25,305 acres in the Odugathur range and prescribed coppice with standards on a 25-year rotation. In the same year he wrote another plan for an area of 97,157 acres in the Odugathur, Santavasal and Polur ranges, and in 1905 a third plan for the remainder of Santavasal and Polur. In both the latter plans, which were revised by Mr. J. S. Battie in 1907, in so far as the Santavasal and Polur ranges were concerned, the method of treatment was coppice with standards on a 30-year rotation.

185. In 1916, owing to the classification of reserves and the inclusion of many unworkable areas, in some cases whole coupes lying on hill tops, the prescriptions of the then existing working plans became impossible to work and in anticipation of the complete revision of all the old fuel working plans the Board of Revenue, at the instance of the Conservator, sanctioned a 6 year programme of working for all fuel forests on a 30 year rotation (B.P. No. 1371, dated 13th October 1916). The scheme continued until 1921–22 when the whole question of fuel working was examined. It was then found that many unworkable areas were still included in coupes, that the size of the coupes was in some cases too large and that it was desirable to increase the rotation to forty years. As a result Mr. H. W. A. Gaudoin wrote his working plan for the Santavasal, Polur and Tiruvannamalai ranges (C.C.P. No. 114, Press, dated 6th May 1925) and Mr. E. K. Krishnan a tentative scheme for Odugathur (IV Circle Conservator's D. Dis. No. 625/25-C, dated 20th October 1925).

186. The method of treatment in the Palar plantations was not the same as that adopted in the other fuel bearing areas of the divisions. A brief description of these plantation has been given in paragraphs 64 and 65 above. A rotation of ten years was fixed for felling the casuarina which had been planted between 1,873 and 1,890, and clear felling was carried out until 1910–11, after which 20 standards per acre were reserved in each coupe under the prescriptions of a provisional working plan which was current from 1906–07 to 1913–14. The revision of this provisional plan was not undertaken as, owing to the recommendations of the Forest Committee in 1913, five of the seven plantations were placed in class III reserves and disafforested from 1st October 1914 (B.P. No. 19696, dated 18th September 1914). In 1915 on the recommendation of Mr. P. M. Lushington, Conservator of Forests, the then Southern Circle, the five disafforested plantations were reafforested and a revised working plan for them was drawn up by Mr. T. N. Hearsey(B.P. No. 107, Forest dated 13th July 1916). Although this plan expired in 1930–31 its prescriptions have been continued from year to year.

(*b*) Prior to Mr. Brand's Working Plan.

187. The methods of treatment and the subdivision of the area according to the period prior to Mr. Brand's Working Plans, are dealt with in the following paragraphs.

188. *Santavasal, Polur and Tiruvannamalai ranges.*—Mr. Gaudoin's plan prescribed simple coppice on a rotation of forty years. The District Forest Officer however had the discretion of reserving fruit trees for minor forest produce and a limited number of seed bearers

of valuable species in coupes where they appeared desirable. The fuel producing areas of the three ranges were divided into twenty felling series as detailed below :—

Santavasal Range.

1 Karnatigur felling series.
2 Santavasal Felling Series.
3 Attuparai Felling Series.
4 Kelur Felling Series.*
5 Velankuppan Felling Series.
6 Ameradi Felling Series.
7 Karungalthodi felling Series.

Polur Range.

8 Pullemedu Felling Series.
9 Jambumalai Felling Series.
10 Parvadamalai Felling Series.*
11 Periamalai Felling Series.
12 Thaniyar Felling Series.

Tiruvannamalai Range.

13 Annamalai Felling Series.*
14 Thippakadu I Felling Series.*
15 Thippakadu II Felling Series.*
16 Kavuthimalai I Felling Series.*
17 Kavuthimalai II Felling Series.*
18 Radhapuram Felling Series.*
19 Kannamadai Felling Series.*
20 Ponniar East Felling Series. *

189. Coupes were not numbered nor were they allotted to definite years of felling. Thus in cases where there was no demand the whole felling series was automatically closed and confusion owing to arrears of working did not arise. The District Forest Officer was at liberty to start fresh felling series in hitherto unworked areas, provided he foresaw a demand for a reasonably long sequence of coupes.

190. *Odugathur Range.*—Mr. E. K. Krishnan's tentative scheme prescribed simple coppice in the poorer areas and coppice with standards where the existing growth justified the retention of standards. In both cases the rotation was thirty years and the District Forest Officer had the discretion of retaining sound young trees capable of yielding minor forest produce. In the better type areas standards were to be selected from timber and minor forest produce yielding trees and the number was limited to 20 per acre. The fuel producing areas of the range were divided into twenty-three felling series as detailed below :—

Coppice with standards.

1 Usoor Felling Series.
2 Thellai Felling Series.
3 Panangateri Felling Series.
4 Naickaneri Felling Series.
5 Komiar Felling Series.

Simple coppice.

6 Vellakal Felling Series.
7 Nacharkuppam Felling Series.
8 Pachakuppam Felling Series.
9 Agaram Felling Series.
10 Kuppampalayam Felling Series.
11 Kallaparai Felling Series.
12 Asanampet Felling Series.
13 Rasimalai Felling Series.
14 Pallipattu Felling Series.
15 Kachiguddai Felling Series.
16 Thattankinar Felling Series.
17 Nellimalai Felling Series.
18 Kylasagiri Felling Series.
19 Varadalampattu Felling Series.
20 Vallaka (Sholavaram) Felling Series.
21 Kaniyambadi Felling Series.*
22 Vandikallu Felling Series.*
23 Paravamalai Felling Series.*

191. Coupes were numbered and allotted to definite years of working, and in some cases, two annual coupes were prescribed in those felling series where the numbers of the

*NOTE.—Felling series since transferred to panchayat management.

coupes which were being exploited at the commencement of the period of the plan did not correspond with those of the coupe in the majority of the felling series. By this prescription it was hoped that a stage would be reached later, when, in a particular year, the number of the coupe under working in each felling series would be the same. This however was not attained.

192. *The Palar plantations.*—With the introduction of Mr. Hearsey's working plan in 1916 the method of treatment in these plantations was changed from clear felling to selection-*cum*-improvement. A felling cycle of fifteen years was prescribed, and all dead, dying, crooked, old and hollow trees were to be removed. The stools of all trees under three feet in girth had to be coppiced. The seven plantations aggregating 1,388 acres were divided into four working circles as under:—

	ACS.
1 Virinjipuram—Included Virinjipuram and Ammundi plantations	476·25
2 Chenur—Included Chenur and Vikramachi plantations	258·63
3 Kilminal—Included Kilminal and Tiruvellam (Part)	266·40
4 Tiruvellam—Included Tiruvellam (part) and Vannivedu	386·52

193. *Cleaning.*—A cleaning was prescribed in each coupe in the Santavasal, Polur and Tiruvannamalai ranges for three successive years after felling. The operation consisted in removing creepers and weeds choking coppice growth. No cleaning was provided for in the Odugathur Range, except that the contractor was expected to cut, at the time of felling, all thorny creepers and shrubs and prickly-pear within two yards of a coppiced stool. In the Palar river plantations it was prescribed that all creepers and prickly-pear should be uprooted and the prickly-pear buried in pits, in each coupe, in the year of felling and thereafter in the fifth and tenth years.

194. *Artificial regeneration.*—In the Santavasal, Polur and Tiruvannamalai ranges nothing definite was prescribed, but the question of sowing was left to the discretion of the management. In the Odugathur range it was prescribed that suitable patches each about one chain square, should be selected by the Range Officer in the coupe felled during the previous year and dibbled with seeds of the more important species, like *Pterocarpus marsupium*, *Terminalia spp.*, *Melia indica*, *Albizzia spp.* and *Anogeissus latifolia*. No burning was prescribed, seed was to be dibbled at stake at an espacement of 6 feet into 6 feet in prepared patches 18 inches in diameter. Sowing was to be done a month before the break of the south-west monsoon.

195. In the Palar river plantations blanks were to be restocked by planting out nursery grown seedling at an espacement of 9 feet into 9 feet. The species prescribed were Inga dulcies in low-lying areas, *Dalbergia sisso* on high ground, *Terminalia arjuna*, *Albizzia amara*, *Hardwickia binata*, red sanders and any other species that are known to do well in the locality. No casuarina or *Pithecolobium saman* were to be put down. Red sanders and *Hardwickia binata* were specially prescribed for well-drained areas in Chennur and Vikramachi, while *Terminalia arjuna* and *Acacia arabica* were to be planted in low-lying places. In addition a sowing in mounds was prescribed in the Chennur and Tiruvallam Working Circles. The mounds were to be dug and got ready during April, May and the early part of June and the sowing done immediately after. Mounds were to be watered until germination took place.

196. *Cutting minor forest produce yielding trees and thorny growth at time of felling.*—In the Santavasal, Polur and Tiruvannamalai ranges nothing definite was prescribed. The District Forest Officer was made responsible for drawing up agreements embodying conditions suitable for each locality. It was however suggested that minor forest produce yielding trees be reserved irrespective of shape or size and that non-climbing shrubs, such as *Raudia dumetorum*, be left standing to cover the ground if they were not saleable as fuel. In the Odugathur Range, excluding the Palar river plantation coupes, it was prescribed that sound young minor forest produce yielding trees may be retained and that thorny creepers and shrubs should be cut only when growing within two yards of a coppiced stump.

197. The practice at the time of Mr. Brand writing this plan was that practically all minor forest produce yielding trees were retained and the contractor was not bound to cut and remove thorny and other growth two inches and under in girth except such quantity as was required for fencing the coupe.

198. *Closure to grazing.*—Grazing is strictly prohibited in the Palar river plantations. Elsewhere coupes are closed to grazing in the year of felling and for five years thereafter. Under the terms of his agreement each contractor is bound to erect a thorn fence around the coupe leased to him ; but nowhere are the dimensions of the fence specified and in most cases it is inefficient and no barrier at all.

199. *Indicator areas.*—Indicator areas are mainly intended to furnish yield figures which will serve as a check on prices bid by contractors. They were first felled in 1928–29. A separate indicator area was selected in each coupe and represented not less than 5 per cent of its area and coincided with a strip line varying in width from one to two chains. In 1930, strip lines were cleared one chain wide, or of such less width as would provide an indicator area not exceeding 1 per cent of the area of the coupe, subject to a minimum of one acre. Felling was done under departmental supervision and the expenditure incurred was recovered from the contractor who subsequently purchased coupe in question and the resulting produce released to him after it has been stacked and measured. At the time of Mr. Brand writing the plan indicator areas for the succeeding years were being selected and felled in the current year's coupe by the contractors themselves. This alternative was a sound one as it involved no subsequent adjustment of expenditure and should produce quite satisfactory result as the quality of growth was generally similar in adjoining coupes.

(c) Result of working prior to Mr. Brand's plan.

200. As regards the results of past working prior to his working plan Mr. Brand records as follows :—

Fellings.—As was anticipated when Mr. Gaudoin's working plan was written in 1925, several of the fuel felling series which were prescribed in the Santavasal, Polur and Tiruvannamalai ranges have not been worked regularly as the demand for fuel is largely met by supply from panchayat reserves which are mostly situated around the chief markets at Vellore, Polur and Tiruvannamalai. For the same reason there has been no regular demand for many of the fuel series in the Odugathur Range. The areas felled annually from the years in which fellings were commenced according to the various working plans are given in paragraph 224 below. It is impossible to say whether the forest has improved or not as a result of past working but it is very probable that the poorer type areas have deteriorated in localities exposed to illicit felling.

201. *Cleaning.*—Prior to 1931–32 there is no record of cleaning having been done in any of the coupes. Subsequent to this date the operation was confined to creeper cutting by subordinates in the Polur range, and by either subordinates or coupe contractors in the Palar river plantations. It is recorded in the control journals that no cleaning was necessary in the worked coupes of other ranges. No expenditure was incurred on the operation except in 1919–20 and 1929–30, when Rs. 20 and Rs. 11–4–0 were spent in the Vannivedu and Virinjipuram plantations, respectively.

When prickly-pear occurred in Palar river plantation coupes it was uprooted free of cost, either by subordinates or coupe contractors. The area dealt with each year has not been recorded but the operation continued until 1931–32 when the cochineal insect was introduced and in a few years destroyed practically all prickly-pear that remained.

202. *Artificial regeneration.*—In the Santavasal, Polur and Tiruvannamalai ranges as nothing was definitely prescribed nothing was done. In the Odugathur range efforts were confined to sporadic, generally unsatisfactory, dibbling by subordinates. Sowing and planting in the coupes of the Palar river plantations were discontinued in 1922 (C.C.P. Ms. No. 504, dated 30th October 1922), after which no regular planting was done, except in occasional patches by the subordinates, the species being *Cassia siamea*, *Melia dubia* and red sanders.

In 1931–32 the system of restocking blanks in worked fuel coupes by 'rab' * sowing was introduced. As this system has now been adopted in fuel coupes throughout the Presidency it is not necessary to enter into a detailed description of it here. The species sown were *Cassia siamea*, *Acacia sundra*, *Albizzia amara*, *Albizzia lebbek*, *melia indica*, *Terminalia tomentosa*, *Terminalia paniculata*, *terminalia arjuna*, *Pongamia glabra*, *Sapindus trifoliatus*, *Anogaissus latifolia*, teak, rosewood, vengai and red sanders. Sowing was done in July and September. The July sowing was generally ineffective, while that done in September produced good germination but the subsequent development of the seedlings was poor. In fact, with the exception of *Cassia siamea*, *Acacia sundra*, *Albizzia lebbek* and *Albiazzia amara* few seedlings survived the first hot weather. There is no doubt that *Cassia siamea* gives the best results. The 'rab' patches sown in Santavasal Coupe IX are a striking example of what can be achieved by this method.

---

* Dibbling seeds in the ash of burnt heaps of debris.

15

The following statement shows the areas restocked since 1931–32 :—

Year.	Name of felling series and coupe number.	Area treated.	Cost of operation. Preparation of soil and dibbling.	Cost of operation. First weeding.	Cost of operation. Fencing.	Cost of operation. Second weeding and re-placing casualties.	Total cost per acre.	Date of enumeration.	Species sown and result of operation. Cassia siamea.	Albizzia amara.	Albzzia lebbek.	Sapindus tripoliatus.	Dalbergia latifolia.	Acacia Sundra.	Tectona grandis.	Melia-indica.	Terminalia paniculata.	Terminalia tomentosa.	Anogeissus latifolia.	Pterocarpus marsupium.	Pongamia glabra.	Pterocarpus suntalinus.	Terminalia arjuna.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
		ACS.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.																
								Odugathur Range.															
1933–34	Not specified		Free of cost					only cassia siamea sown.							Regeneration prolific.								
								Santavasal Range.															
1931–32	Santavasal, VIII	23	51 14 0	26 5 0	..	..	3 6 0	Not known	619	183	130	65	30	470	83	103	0	0	0	34	..	..	..
								Do.	80	35	8	129	0	173	48	38	0	0	0	2	..	..	..
1932–33	Santavasal, IX	20	45 14 0	9 0 0	1 0 0	13 6 0	3 7 0	March 1933	878	142	492	26	0	683	34	6	0	0	0	1	..	..	..
1933–34	Santavasal, X	15	36 12 0	6 12 0	1 0 0	10 4 0	3 10 0	January 1934	896	52	669	7	0	402	41	0	0	0	0	11	38	..	
1934–35	Santavasal, XI	10	30 7 0	4 11 0	1 8 0	2 6 0	3 14 0	15th February 1935	1,727	230	353	..	..	447	..	161	..	..	..	..	48	9	..
								Polur Range.															
1933–34	Thaniar, X.	15	35 3 0	..	..	..	2 6 0	February 1934	844	200	3	..	..	48	28	633	..	2	..	46	..	..	..
1934–35	Thaniar, XI	22	33 10 0	..	..	2 4 0	1 10 0	January 1935	Species not known. 486 patches successful.														
								Tiruvannamalai Range.															
1933–34	Ponniar East, VIII	30	46 1 0	7 0 0	..	..	1 12 0	January 1934	592	340	643	245	..	1,233	..	313	..	..	..	..	..	..	22
1934–35	Ponniar East, IX	230 patches.	40 2 0	7 0 0	..	3 0 0	..	Not known	734	71	95	27	..	96	..	3	..	..	..	..	..	..	..

NOTE.—Where zero occurs in a species column it means that the species was sown but that there was no germination. Blanks indicate that the species was not sown.

(*d*) Mr. Brand's plan.

203. (*a*) *General constitution and area and subdivision.*—The fuel and small timber working circle was 59,975 acres in extent. Better areas were selected for fuel working and degraded types were formed into green leaf manure blocks while inaccessible areas and rocky hill tops were omitted. The Silvicultural system prescribed was simple coppice with the reservation of sandal, minor forest produce and bark yielding trees. The working circle was divided into 24 felling series of which 20 were ' regular ' series and four ' reserve ' series. The name and area of these series can be seen from columns (1) and (2) of statement below. A rotation of 40 years was prescribed for all the other felling series except the two plantation felling series for which 30 years was prescribed.

(*b*) *Size and allocation of coupes.*—Only ten coupes in each regular felling series were allocated and their position shown on fuel working maps the selection of coupes in reserve series left to the discretion of the District Forest Officer.

(*c*) *Yield.*—The anticipated yield was calculated on the basis of the actuals of the previous 12 years' working.

(*d*) *Regulation of fellings, etc.*—It was prescribed that one coupe in each of the regular felling series and one in each of the reserve series (if there was a demand) should be felled annually. Coupes to be surveyed and demarcated by lines 6 feet wide by the end of November in the year preceding felling. The fuel obtained by clearing lines to be handed over to the contractor and cost recovered.

(*e*) *Agency of felling.*—Agency of felling through contractors and coupes to be sold in auction three months advance of the year of felling, and contractors permitted to cut and supply manure leaves. Lease period for cutting manure leaf was from 1st January to 31st March and for felling and removals from 1st April to 31st March of next year. Fellings in the coupes to proceed strip by strip. Useless tree species not to be cut. The felling rules prescribed were as follows :—

(i) With the following exceptions all trees shall be felled level with the ground leaving the bark intact adhering to the wood all round and without breaking or disturbing the surface of the ground :—

Exceptions.—Sandal, sound tamarind, wood-apple and other minor forest produce yielding trees, bark yielding species, viz., *Cassia auriculata and fistula.*

The trees not to be felled will be marked by Range Officers before the sale and a list prepared and, if required, produced at the sale for the information of bidders.

(ii) Stools need not be coppiced.

(iii) Useless species need not be felled unless they occur in or near a *rab* line, when they shall be removed.

(iv) Sufficient thorny growth shall be cut to provide for a fence of the specified dimensions and for the required number of *rab* heaps.

(v) All fellings in the coupe shall be done only by the coolies of the contractor, or his authorized agent, shall be present during the fellings.

Artificial regeneration by ' rab ' sowings in patches 9 feet wide was prescribed. This was subsequently given up as per C.C.P. No. 31/41, dated 17th January 1941, as it was not successful.

(*f*) *Other regulations.*—Mr. Brand prescribed that small timber should be supplied by the contractor to the ryots when they demanded the same for the manufacture of agricultural implements.

Palmyra palms in two plantation felling series to be included as part of fuel crop and felling to be left to the coupe contractors.

(*g*) *Closure to grazing.*—Seven years including the year of felling. Thorn fence round closed areas was prescribed by Mr. Brand, but this was amended in Chief Conservator's D. Dis. No. 655/42, dated 19th November 1942 and only coupes where regeneration operations were undertaken were prescribed to be fenced.

Coupe stones to be planted after completion of felling at each of the four salient corners of a coupe, with coupe number and year of felling engraved on each stone.

(*h*) *Results of working during the currency of Mr. Brand's plan.*—The fuel series continued to be worked satisfactorily as per prescriptions till 1941–42. Since then due to the dearth of fuel in Madras, on account of the war the normal working of the areas for fuel as prescribed was found insufficient and so more coupes in one and the same series had to be worked in each year and in addition extra areas from outside the fuel working circle were selected piecemeal here and there by the district staff under proper sanction and worked. The statement below shows to particulars of work done from 1936–37 to 1947–48 in Mr. Brand's fuel felling series and also in areas outside the scope of the working plan.

The Palar plantations in East and West Fuel Felling series were ordered to be converted into casuarina plantations due to petrol rationing in 1941–42 and consequent necessity for more charcoal. Accordingly the areas were clear-felled and planted up with casuarina.

Statement showing the fuel felling series from 1936–37 to 1947–48.

Name of the fuel felling series.	*Area of the fuel felling series.*		*Area that should be worked as per working plan.*		*Area actually worked including 1947–48.*	*Average area of the coupe.*	*Number of years worked in advance.*	*Balance of the area in the fuel felling series.*
(1)	(2)		(3)		(4)	(5)	(6)	(7)
			REGULAR FELLING SERIES.					
			I. Odugathur Range.					
	ACS.		ACS.		ACS.	ACS.		
1 Ambur ..	3,322	I—XII	1,022	I—XIV	1,149	83	2	2,173
2 Naickaneri ..	3,678	I—XII	1,120	I—XIII	1,106	92	Nil.	2,572
3 Panankatteri ..	3,088	I—XII	987	I—XIV	969	77	1	2,119
4 Pallipattu ..	1,758	I—XII	550	I—XV	751	44	5	1,007
5 Kuppampalayam.	1,583	I—XII	527	I—XV	996	40	12	587
6 Asanampattu ..	2,898	I—XII	855	I—XVI	958	72	1	1,940
7 Thattankinar ..	1,926	I—XII	677	I—XV	754	48	4	1,172
			II. Vellore Range.					
1 Komiar ..	3,051	I—XII	927	I—XVI	1,145	76	3	1,906
2 Usoor	3,438	I—XII	754	I—XVI	1,125	61	6	1,313
3 Vellakkal ..	1,893	I—XII	580	I—XVII	856	47	6	1,037
4 Thellai	3,210	I—XII	973	I—XVII	1,532	80	7	1,678
5 Plantation East.	541	I—XII	176	I—XII	530	14	27	11
6 Plantation West.	568	I—XII	210	I—VIII and balance area.	440	14	21	128
7 Karungalthody.	2,650	I—XII	767	I—XVII	902	66	2	1,748
			III. Santavasal Range.					
1 Amerdi ..	1,012	I—XII	285	I—XVII	504	25	8	508
2 Santavasal ..	2,200	I—XII	648	I—XVII	900	55	4	1,300
3 Karnatagiri ..	3,730	I—XII	1,084	I—XIII	1,112	93	..	2,618
			IV. Polur Range.					
1 Thaniar ..	3,326	I—XII	988	I—XVI	1,360	83	4	1,966
2 Pullumedu ..	1,240	I—XII	387	I—XVI	600	31	7	640
			V. Tiruvannamalai Range.					
1 Ponniar East ..	3,910	I—XII	1,206	I—XVI	1,508	98	3	2,402

RESERVE SERIES.

Name of the felling series.	*Area of the felling series.*		*Area actually worked.*	*Balance area in the series.*
(1)	(2)		(3)	(4)
I. Odugathur Range.				
1 Panankattery	1,657	I—IX	1,247	410
2 Kallaparai	1,850	I—X	610	1,240
II. Polur Range.				
1 Jambumalai	1,254	I—IX	323	931
III. Tiruvannamalai Range.				
1 Ponniar West	2,190	I—IX	423	1,767

SPECIAL SERIES.

Name of the area.	*Approximate area.*	*Areas worked including 1947–48.*	*Areas available from 1948–49.*
(1)	(2)	(3)	(4)
I. Odugathur Range.			
I. Ambur Reserved Forest—	ACS.	ACS.	ACS.
Block I	478	478	..
Block II, Munukkal	1,170	943	227
Kallaparai special Block III	1,000	522	478
Block IV	118	116	..
II. Ambur Fuel Reserved Forest—			
Block I	1,000	640	360
III. Vellakkal Reserved Forest—			
Block I	97	97	..
Block II	93	93	..
Block III	600	461	139
IV. Shanankuppam Reserved Forest	600	..	600

Statement showing the fuel felling series from 1936-37 *to* 1947-48—cont.

SPECIAL SERIES—*cont.*

Name of the area. (1)	*Approximate area.* (2)	*Areas worked including* 1947-48. (3)	*Areas available from* 1948-49. (4)
	I. Odugathur Range—cont.		
V. Karuthamalai Reserved Forest—	ACS.	ACS.	ACS.
Block I	1,700	275	1,425
Block II	1,100	293	807
Block III	2,000	..	2,000
	II. Santavasal Range.		
Puttur and Malayalam Reserved Forests—			
Malayalam block	605	605	..
	III. Polur Range.		
I. Veerappanur Reserved Forest—			
Gillman series—			
Block I	1,400	450	950
Block II	1,300	652	648
Block III	600	..	600
Block IV	240	..	240
II. Patrakad Reserved Forest—			
Block I	3,000	..	3,000
	IV. Tiruvannamalai Range.		
I. Ponniar Reserved Forest— or			
Veppur Block I	1,800	732	1,068
Veppur Block II	2,500	..	2,500
Reddipalayam III	3,200	289	2,911
II. Valasamalai Reserved Forest ..	700	..	700
III. Royandapuram Reserved Forest—			
Block I	1,000	501	500
Block II	250	..	250
IV. Perungalathur—			
Swamimalai Reserved Forest ..	1,700	..	1,700
V. Pavunjipet Reserved Forest—			
Block I	2,200	..	2,200

The special scheme " Concentrated Regeneration by Kumri method " drawn up by Mr. Mitchell and approved in Salem Circle Conservator's No. 1145/43-C, dated 28th April 1944, came into effect from 1945-46 and some areas have been kumried according to the prescriptions. Results are not very satisfactory as no Kumridars came forward, but mostly the work is done by department.

Minor Forest Produce.

(*a*) Prior to Mr. Brand's plan.

204. Mr. Brand records as follows :—

" Very little is recorded in early working plans regarding the exploitation of minor forest produce. All that was prescribed is contained in the sentence. 'The lease system might be continued as hitherto', or words to that effect. That there was systematic working however is evident from the information contained in the second paragraph of Chapter II of Mr. K. R. Venkataramana Ayyar's Working Plan of 1920 for the Santavasal, Polur and Tiruvannamalai Ranges, from which the following paragraphs are extracts."

205. The right to collect minor forest produce was leased annually to the highest bidder, separate leases being granted for—

(*a*) Avaram bark, *Cassia auriculata.*

(*b*) Konnari bark, *Cassia fistula.*

(*c*) Surul bark, *Ventilago madraspatana* and *Ventilago calyculata.*

(*d*) Other minor forest produce.

The leases in all cases were for the forest year ending 30th June.

206. There is very little avaram in the reserved forests, but for the facility of working, the prevention of possible smuggling of the produce and avoidance of friction between neighbouring contractors, the right to collect avaram bark in the reserves and unreserves of each forest range was sold in one lot, as sale on smaller units, such as by Revenue Inspector's firka, was not found feasible. The lease was sometimes granted for one year but at other times for three years. This system continued until 1918 when the control of the collection and sale of this bark was taken up by the Munitions Department on a fixed

annual rental as a war measure. This control was however relaxed in 1919 when the right was as usual sold in auction as one lot for the collection of the produce from all the reserved forest and unreserved lands of each range . . . . . it may be estimated that only about 5 per cent of the annual revenue from this source in each range could be credited to the reserved forests.

207. *Cassia fistula*, on the other hand, is chiefly found in the reserved forests though an occasional tree may be found in the unreserves. The reasons which led to the rangewar sale of avaram bark also applied in the case of konnai bark, and the right to collect the latter bark was sold on an annual or triennial lease until the year 1912–13, when the cutting down of the tree for its bark was stopped on silvicultural grounds. Owing however to the special demand which arose for this bark during the war, its collection was resumed in the year 1917–18, as a special war measure, when the right to collect it was sold in auction in 1917–18 and 1918–19 after which it was stopped. Nearly 80 per cent of the average annual revenue in the past, from this source can be credited to the reserved forests.

208. As regards surul bark, the lease was annual and the sale by ranges, the collection extending over all the reserves and unreserves in each range. This climber, from the root of which the bark for dyeing is extracted, is mostly found in the reserved forests.

209. The other articles of minor forest produce . . . . were sold annually in separate blocks, each block complising a whole bamboo working circle under the old arrangement.

210. Mr. K. R. Venkataramana Ayyar's Working Plan divided the three ranges, Santavasal, Polur and Tiruvannamalai, into ten minor forest produce blocks, each block coinciding with a bamboo block. The right of collection was sold annually in auction for the year ending 30th June. The unit of sale was a block, except that in the case of avaram and surul barks each range sold separately.

211. In 1925 Mr. K. R. Venkataramana Ayyar's plan was superseded by Mr. Gaudoin's plan but the system of working remained essentially the same. The whole area was divided into a number of farms and the farm became the unit of sale. The District Forest Officer was however allowed the discretion, should a demand arise, of combining two or more farms together and of selling on a biennial lease products which have a commercial value such as barks and nux vomica. The following statement shows the subdivision of the area into farms :—

Minor Forest Produce Farms.

For avaram bark—

1. Reserves and unreserves of the Polur Range.
2. Reserves and unreserves of the Santavasal Range.
3. Reserves and unreserves of the Tiruvannamalai Range.

For nux vomica—

1. Reserves of the Polur Range.
2. Reserves of the Santavasal Range.
3. Reserves of the Tiruvannamalai Range.

For surul bark—

1. Reserves of the Polur Range.
2. Reserves of the Santavasal Range.
3. Reserves of the Tiruvannamalai Range.

Other minor products—

Santavasal Range . .	1. *Amerdi farm.*—Includes the Amerdi bamboo block, Amerdi fuel felling series, Amerdi plantation, Attupara timber and fuel felling series. 2. *Odugathur farm.*—Includes Odugathur hill and plains bamboo blocks. 3. *Shembakatope farm.*—Includes Shembakatope hill and plains bamboo blocks. 4. *Santavasal farm.*—Includes Santavasal reserve excluding portions included in Santavasal bamboo felling series. 5. *Karnatagiri farm.*—Includes Karnatagiri reserve excluding the portion included in Santavasal bamboo felling series.

Other minor products—*cont.*

Polur Range	6. *Arasampet farm.*—Includes Arasampet bamboo block. 7. *Komitiyeri farm.*—Includes Komitiyeri bamboo block. 8. *Chillimalai farm.*—Includes Patrakad reserve. 9. *Periyamalai farm.*—Includes Periyamalai reserve. 10. *Parvadamalai farm.*—Includes Mulakad reserve.
Tiruvannamalai Range ..	11. *Ponniar farm.*—Includes the portion of the Ponniar reserve falling within the division. 12. *Kalroyan farm.*—Includes the Valasamalai, Nattampalli, Perungolathur, Swamimalai and Pavanjipattu reserves.

NOTE.—Farms, or parts thereof, which have since been transferred to panchayat management have not been included in the above.

212. In the Odugathur Range the right to collect minor forest produce, other than barks, was sold annually in blocks, the arrangement of which varied from time to time. In the case of barks the unit of sale was the range. Prior to 1919 the blocks were so arranged that the collection in each could be controlled by the nearest tannadar. With the abolition of tannadars an arrangement was adopted whereby each block consisted of a group of reserves, or parts thereof, which were adjacent to one and the same market. With minor changes the system has continued to date. The latest arrangement adopted in 1933, is as follows :—

Block I.—Includes Athiyur, Thellai, Kylasagiri and part of the Arasambattu reserves.

Block II.—Includes Appukal, Nellimalai and part of the Arasambattu reserves.

Block III.—Includes Karuthamalai reserve and Arasambattu rest-house compound.

Block IV.—Includes Vellakal, Ambur, Ambur fuel and Shanankuppam reserves and the Ambur rest-house compound.

213. The Palar river plantations, with the exception of Virinjipuram and Vikramachi which are grouped together, are leased separately for the collection of minor forest produce.

214. Results of past working show that the present arrangement of leases works satisfactorily. However, when one pauses to consider that the average jurisdiction of a forest guard and his watcher is 8·66 square miles, it can easily be understood that it is impossible for subordinates to exercise an efficient control over removals. Each contractor submits a monthly statement showing the quantity of each item of produce removed by him during the period of his lease, but it is probable that the figures so furnished are inaccurate and not to be relied on.

(*b*) Mr. Brand's plan.

214-A *General constitution and subdivision of the area.*—The working circle comprises of all the reserves of the division, all the unreserves on the Javadi Hills and all the unreserves for the purpose of avaram (*Cassia auriculata*) and Konnai (*Cassia fistula*) bark leases. It was prescribed that collection of barks and nux vomica should be done by ranges, quarries to be leased separately or in groups and other produce by farms. The 16 farms prescribed by Mr. H. W. A. Gouddin were allowed to continue. Banavaram and Palar river plantations were constituted as separate units.

Departmental working was prescribed to be resorted to with the prior sanction of the Conservator, if found expedient. Honey and wax were collected departmentally.

Past working shows that there is always a clash of interest between the departmental contractors and the Malayalees and the plainsmen in spite of the fact that the contractors have been instructed to be very fair in dealing with the Malayalees and their patta produce. This position can be eased if the minor forest produce contractors would only pay the Malayalees a reasonable price.

SECTION 3—FIRE PROTECTION.

Prior to Mr. Brand's Working Plan.

215. The system of fire protection in vogue falls under three heads, namely, (*a*) special, (*b*) general and (*c*) early burning.

(*a*) *Special protection.*—(i) Each 'specially protected block', vide paragraph 153 above is protected by a 30 feet wide fire line all round it and these lines are always kept clear by the Malayalees under the hill village system.

(ii) Two interior fire lines are being maintained to a width of 66 feet, on the Gangavaram fire line and the other the Karnatigur fire line. The Gangavaram line marks the southern limits of the sandal areas as they existed in 1915, and runs from the southernmost corner of Patrakad reserve in a north-easterly direction to Valipariamalai in the Moolakad reserve. It was probably intended to serve as a fire barrier to prevent fires crossing over from non-sandal to sandal bearing areas. As sandal has now extended far south of the line, the line no longer serves the purpose for which it was probably intended. Further, as most of the fires in the Javadi hills are due to incendiarism, other methods must be employed for their prevention. The Karnatigur line runs parellel to the general direction of the Karnatigur bridle path and crosses the path at several places in between zigs. The object of this line is obscure and as it runs straight up the hillside, at right angles to the contours, it is of no value. The length of the Gangavaram fire line is 16 miles 2 furlongs, while that of the Karnatigur fire line is 13 miles 6 furlongs. The annual expenditure incurred on clearing and burning these lines is Rs. 182.

(iii) The following exterior fire line in the Kalroyan hills of the Tiruvannamalai range are cleared and burnt annually at an average cost of Rs. 1–10–0 per mile :—

	MILES.	FURLONGS.
Southern boundary of Nattampalli reserve, adjoining jagirs.	5	1
Common boundary between the Perungulathur-Swamimalai and Nattampalli reserves	2	4
Common boundary between the Nattampalli and Valasamalai reserves	0	3

(b) *General protection.*—Under the forest village system the Javadi hill reserves of the Santavasal and Polur Ranges and that part of the Thellai reserve situated in the Odugathur Range are divided into 153 grazing blocks—vide paragraph 120 above. Each block is assigned to a definite village for fire protection and the villagers are paid rewards (dealt with further in paragraph 218 below) at the end of the fire season if there have been no fires at all ; smaller rewards, if, should a fire have broken out, they have circumscribed its limits to a small area ; and no rewards if any large area has been burnt. The same system is being followed in the Valasamalai, Nattampalli and Perungolathur-Swamimalai reserves on the Kalroyan hills. Elsewhere in the division local subordinates are responsible for general fire protection and can of course obtain assistance from neighbouring villages.

(c) *Early burning.*—Early burning was prescribed for the whole of the Odugathur Range but the system was not followed as, it is recorded, conditions in the division did not appear to require it. The following cart-tracks and footpaths were however fire traced annually early in the fire season at an average cost of Rs. 2 per mile.

	MILES.
Asanampet-Alangayam cart-track	1½
Ambur-Asanampet cart-track	1½
Sholavaram-Vellakal footpath	} 2½
Athiyur Karumalai footpath	
Ambur-Naickaneri footpath	1

216. *Results of fire protection.*—The following statement, extracted from administration reports, show the area over which fire protection was attempted during the five years ending 1934 and the extent and percentage which was successfully protected :—

Calendar year.	*Area attempted square miles.*		*Area protected square miles.*		*Percentage of success.*		*Remarks.*
	Special.	*General.*	*Special.*	*General.*	*Special.*	*General.*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1930	158	309	152	306	96·2	99·0	Areas are furnished to the nearest square mile and the percentages calculated thereon.
1931	158	309	146	303	92·4	98·1	
1932	158	309	155	294	98·1	95·1	
1933	158	309	156	302	98·7	97·7	
1934	158	309	155	303	98·1	98·1	

217. *Costs.*—The following statement shows the expenditure incurred on fire protection for the five years ending 1934 :—

Calendar year.	*Maintenance of interior fire lines.*	*Maintenance of exterior fire lines.*	*Fire rewards.*	*Fire tracing cart-tracks and footpaths.*	*Total expenditure.*	*Total area attempted to be protected.*	*Cost per square mile.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.		RS. A. P.
1930	205 2 0	94 0 0	683 4 0	40 0 0	1,022 6 0	158 square miles.	6 7 0
1931	223 12 0	94 0 0	672 3 0	8 0 0	977 15 0		6 5 0
1932	90 6 0	32 0 0	672 5 0	9 13 0	804 8 0		5 1 0
1933	104 14 0	32 0 0	773 2 0	10 0 0	920 0 0		5 13 0
1934	192 0 0	16 0 0	674 14 0	10 0 0	892 14 0		5 10 0

Rewards.—After the close of the fire season, grazing blocks are inspected by Range Officers who submit their recommendations for payment of rewards to the various

villagers in proportion to the degree of protection obtained. Necessary sanction having been received from the Conservator, the rewards are distributed, in 'durbar', but not until about twelve months have lapsed after the close of the fire season to which they relate. This delay is unnecessary and it is probable that payment of rewards as soon as possible after the fire season would stimulate co-operation and encourage the villagers to take a greater interest in the operation. The maximum fire rewards work out to Rs. 1–15–0, As. 4 and As. 12 per 100 acres for the Santavasal, Polur and Tiruvannamalai Ranges respectively. There appears to be no reason for this large variation and it is not known on what factors the reward has been fixed for each grazing block. The amount of rewards disbursed annually during the five years ending 1934 is shown in column (4) of the statement in the preceding paragraph.

Mr. Brand's Working Plan.

218. (*a*) Mr. Brand adopted the same system that was in vogue till then except the following :—

(i) Discontinuance of protecting specially protected block in Sandal Working Circle as they no longer existed.

(ii) Discontinuance of Gangavaram and Karnatagiri fire lines, since they no longer served the purpose for which they were intended [vide paragraph 215 (*a*) (ii) above].

(*b*) Mr. Brand prescribed only two systems—Special and general. The former involving the allocation of definite areas to definite villages and the payment of rewards for successful protection and that the latter involving the protection of important roads, cart-tracks and footpaths by the local subordinates.

(i) *Special.*—The area under special protection was 88,565 acres in Santavasal, Polur and Vellore Ranges and 18,900 in Tiruvannamalai Range 16½ miles of reserved forest boundary on the Kalroyan hills to be maintained as fire line. Fire rewards fixed at Re. 1 per 100 acres and fines calculated by special formula.

(ii) *General.*—To be undertaken in all reserves where special protection was not carried out. 21¾ miles (of roads, cart-tracks and footpaths) to be fire traced at Rs. 2 per mile.

(*c*) *Results of fire protection.*—The following statement shows the area over which fire protection was attempted during the eleven years ending 1946, and the extent and percentage which was successfully protected :—

Calendar year.	*Area attempted square miles.*		*Area protected square miles.*		*Percentage of success.*		*Remarks.*
	Special.	*General.*	*Special.*	*General.*	*Special.*	*General.*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1936	158	313	156	311	99·1	99·2	Areas are furnished to the nearest square mile and the percentage calculated thereon.
1937	158	313	157	308	99·4	98·5	
1938	158	313	152	306	90·2	97·7	
1939	168	303	157	297	93·0	98·0	
1940	168	303	166	301	99·0	99·0	
1941	168	303	165	295	98·3	97·3	
1942	168	303	167	300	99·4	99·0	
1943	168	303	167	299	99·4	98·7	
1944	168	303	167	296	99·4	97·7	
1945	168	303	164	296	97·7	97·7	
1946	168	303	160	295	95·1	97·3	

(*d*) *Costs.*—The following statement shows the fire rewards distributed for the eleven years ending 1946 :—

Calendar year.	*Fire rewards.*	*Fire tracing cart-track and foot-paths.*	*Total expenditure.*	*Total area to be protected.*	*Cost per square miles.*
(1)	(2)	(3)	(4)	(5)	(6)
	RS. A. P.	RS. A. P.	RS. A. P.		RS. A. P.
1936	929 0 0	..	929 0 0	158 square miles.	5 14 0
1937	1,002 0 0	43 8 0	1,045 8 0		6 10 0
1938	864 0 0	27 8 0	891 8 0		5 15 0
1939	877 0 0	42 0 0	919 0 0	168 square miles.	5 8 0
1940	1,030 0 0	42 8 0	1,072 8 0		6 6 0
1941	996 0 0	43 8 0	1,039 8 0		6 3
1942	1,065 0 0	44 0 0	1,109 0 0		6 10 0
1943	1,043 6 0	44 0 0	1,087 6 0		6 8 0
1944	938 0 0	48 8 0	986 8 0		5 14 0
1945	1,038 2 0	83 8 0	1,121 10 0		6 11 0
1946	920 11 0	84 8 0	1,005 3 0		6 0 0

SECTION 4—SPECIAL WORKS OF IMPROVEMENTS UNDERTAKEN.

219. The following statement gives a list of roads and cart-tracks maintained by the department :—

List of roads.

Serial number and name of road, cart-track or bridle path.	*Year of construction.*	*Capital cost.*	*Length*		*Average annual cost of maintenance.*	*Remarks.*
		RS.	*Miles.*	*Furlong.*	RS.	
		Vellore Range.				
1 Approach road to District Forest Officer's quarters.	1929	200	..	1	..	Not maintained.
2 Thellai-Kinnikulam road	1925	1,200	4	..	175	
3 Branch road from Thellai-Kinnikulam to Palamarathu Kadai.	1928	254	1	2	1	
4 Odugathur-Pinnathurai road	1914 }	} 2,595	{ 4	3	19	
5 Pinnathurai-Anicut road	1910 }		{ 8	..	580	
6 Veppalamarathuchaduram-Thandavankottai bridle path.	1927	1,047	1	2½	10	
7 Kylasagiri bridle-path	1901	405	3	2	35	
		Odugathur Range.				
8 Odugathur-Melarasampet road	1914	1,769	4	6	377	
9 Ambur-Asnampet road	1913	3,764	13	..	767	Capital cost includes Rs. 120 spent for improvements of zigs in 1945.
10 Branch road from Ambur-Asnampet to Panangatteri.	1924	90	..	5	27	
11 Asnampet-Alangayam road up to the range boundary.	1913–14	320	2	6	..	Not maintained.
12 Asnampet-Melarasampet bridle-path ..	1901	364	5	..	33	
		Santavasal Range.				
13 Santavasal-Shenbagathope	1916	1,050	6	7	208	
14 Kinnikulam-Amerdi road	1920–21	625	4	2	352	
15 Amerdi-Nadanur road	1923	19,0,805	11	..	703	Latham road.
16 Mandaparai-Nadanur (part)	1942–43	3,060	3	1	46	Constructed in 1942–43.
17 Diversion to the Santavasal-Shenbagathope road.	1946–47	5,212	2	2	491	
18 Branch road from Amerdi rest-house to Latham road.	1933	88	..	5	..	
		Polur Range.				
19 Veeralur-Jambumalai road	1923	363	2	5	14	No longer maintained.
20 Athimoor-Thaniar road	1914	393	3	6	234	
21 Thaniar-Patrakad road	1914–15	21,361	9	..	949	
22 Patrakad-Komittiyeri road	1924	30,423	12	..	302	Lushington road.
23 Komittiyeri-Burgur road	1928–29	1,941	4	3	100	
24 Branch road from Paliakod rest-house to Lushington road.	1925	600	..	3	144	
25 Komittiyeri-Alangayam to range boundary.	1919	37,294	5	1	271	Part of Gillman road.
26 Burgur-Mandaparai road	Not known.		2	6	98	
27 Mandaparai-Nadanur road (part) ..	1939–40	11,267	2	6	611	
28 Bargur-Melarasampet road	..	2,000	8	6	..	
29 Patrakad ghat diversion road	1945–46 and 1947–48	93,783	2	1	..	

220. The following is a list of buildings in the division :—

Serial number and name of building.	*Year of construction.*	*Capital cost.*	*Nature of building.*	*Average annual cost of maintenance.*	*Remarks.*
		RS.		RS.	
		Headquarters.			
1 District Forest Officer's quarters at Vellore.	1929	25,237	Terraced and tiled.	270	
		Vellore Range.			
2 Rest-house at Pinnathurai	1909	1,334	Tiled ..	33	
3 Rest-house at Kylasagiri	1904	2,585	Do. ..	36	
4 Ranger's inspection shed at Kylasagiri ..	1900	180	Thatched ..	20	
5 Subordinates' quarters at Kinnikulam ..	1916	982	Tiled ..	21	

Serial number and name of building.	*Year of construction.*	*Capital cost.*	*Nature of building.*	*Average annual cost of maintenance.*	*Remarks.*
		RS.		RS.	
Vellore Range—cont.					
6 Rest-house at Virinchipuram	1901	1,591	Tiled	56	Burnt.
7 Maistry's shed at Virinchipuram ..	1901	60	.. ..	7	
8 Rest-house at Banavaram	1902	1,368	Tiled	34	
9 Rest-house at Thellai	1927	790	Thatched ..	63	
Odugathur Range.					
10 Rest-house at Ambur	1904	2,865	Tiled	49	
11 Range officer's inspection shed at Ambur.	1901	77	Do.	26	
12 Subordinates' quarters at Panangatteri.	1908	285	Do.	11	
13 Rest-house at Naikaneri	1924	660	Thatched ..	44	
14 Rest-house at Asnampet	1904	801	Tiled	58	
15 Rest-house at Arasampet	1904	1,638	Do.	85	
16 Rest-house at Odugathur	1904	1,737	Do.	90	
17 Range office at Odugathur	1914	1,840	Do.	39	
18 Range officer's quarters at Odugathur ..	1914	3,069	Do.	113	
19 Subordinates' quarters at Odugathur ..	1915	2,778	Do.	44	
20 Subordinates' quarters at Thottalam ..	1908	880	Do.	25	
Santavasal Range.					
21 Rest-house at Amerdi	1909	1,651	Tiled	65	
22 Rest-house at Athuvambadi	1905	703	Thatched ..	20	Transferred to Revenue Department.
23 Range office at Santavasal	1917	1,736	Tiled	13	
24 Range officer's quarters at Santavasal ..	1925	4,757	Do.	49	Capital cost includes Rs. 190 spent on improvements in 1937.
25 Subordinates' quarters at Nadanur ..	1925	2,689	Do.	13	
26 Rest-house at Shenbagathopu	1914	2,927	Do.	22	
27 Rest-house at Thongamalai	1920	3,982	Do.	4	
28 Subordinates' quarters at Thongamalai..	1918–19	3,220	Do.	13	
29 Sandal godown at Mel Kuppachiur ..	1918	1,316	Do.	40	
30 Range clerk's quarters at Santavasal ..	1938	2,599	Do.	39	Capital cost includes Rs. 49–14–0 spent on the construction of latrines in 1939–40.
Polur Range.					
31 Rest-house at Komittiyeri	1920	6,508	Tiled	54	
32 Subordinates' quarters at Komittiyeri ..	1910	1,872	Do.	19	
33 Forester's quarters at Komittiyeri ..	1930	946	Thatched ..	47	
34 Rest-house at Thaniar	1920	1,110	Tiled	92	
35 Rest-house at Patrakad	1916	4,888	Do.	48	
36 Subordinates' quarters at Patrakad ..	1916	522	Thatched ..	37	
37 Rest-house at Moolakad	1910	705	Tiled	72	
38 Rest-house at Mandaparai	1906	377	Thatched ..	103	
39 Subordinates' quarters at Burgur ..	1920	1,670	Tiled	24	
40 Subordinates' quarters at Koilur ..	1918	2,049	Do.	29	
Tiruvannamalai Range.					
41 Rest-house at Pavunjipattu	1916	2,000	Tiled	64	
42 Subordinates' quarters at Pavunjipattu..	1909	623	Do.	19	
43 Subordinates' quarters at Navakkollai ..	1911	606	....	44	
44 Subordinates' quarters at Athipadi ..	1911	492	Tiled	35	
45 Rest-house at Tandrampet	1907	90	Thatched ..	34	Sold to district board.
46 Rest-house at Tanipadi	1913	2,107	Tiled	40	
47 Range officer's quarters at Tiruvannamalai.	1913	1,470	Do.	95	
48 Range office at Tiruvannamalai ..	1909	9,007	Do.	35	
49 Range clerk's quarters at Tiruvannamalai.	1911	577	Do.	27	Capital cost includes Rs. 34 spent on improvement in 1939.
50 Bungalow watcher's shed at Tiruvannamalai.	1927	60	....	12	
51 Rest-house at Bheemarapatti	1919	2,185	Tiled	20	
52 Rest-house at Pudur-Chekkadi	1928	798	Thatched ..	61	

221. The following is a list of wells in the division :—

Serial number and situation of wells.	*Year of construction.*	*Capital cost.*	*Description.*	*Average annual cost of maintenance.*	*Remarks.*
		RS. A. P.		RS. A.	
		Headquarters.			
1 District Forest Officer's quarters at Vellore.	1929	602 4 0	Brick in mortar	..	
		Vellore Range.			
2 Rest-house compound at Pinnathurai ..	1914	121 1 0	Brick in mortar	4 0	
3 Subordinates' quarters at Kinnikulam ..	..	200 0 0	Do.	3 0	
4 Rest-house at Virinchipuram	..	150 0 0	Do.	2 0	
5 Rest-house at Banavaram	1900	400 0 0	Do.	4 0	
6 Kilminnal plantation	..	100 0 0	Earthenware section ..	..	
7 Erikollai in Arasampet Reserve Forest ..	1941–12	410 0 0	Do. ..	0 8	Rural uplift.
		Odugathur Range.			
8 Range officer's quarters at Odugathur ..	1914	221 9 5	Brick in mortar	8 0	
9 Rest-house at Odugathur	1904	100 0 0	Brick in mud	6 0	
10 Rest-house at Ambur	1904	600 0 0	Brick in mortar	5 0	
11 Subordinates' quarters at Thottalam ..	1908	300 0 0	Brick in mud	3 0	
12 Kallaparai village	..	150 0 0	Rough stone dry	..	
13 Panangatteri	1937–38	321 6 0	....	14 0	
		Santavasal Range.			
14 Rest-house at Nadanur	1923	250 0 0	Brick in mortar	3 0	
15 Range office at Santavasal	1923	285 0 0	Brick in mud	4 0	
16 Rest-house at Shenbagathope	1914	650 0 0	Brick in mortar	3 0	
17 Inspection shed at Athuvambady	Prior to 1882.	..	Do.	1 0	Transferred to Revenue Department—C.S.O. No. 80/40. 19th May 1940.
18 Sathampet village	1930	293 0 0	Brick in mud	1 0	
19 Amerdi village	1931	361 0 0	Do.	4 0	
20 Periyathipattu village	1931	295 0 0	Do.	1 0	
21 Thongamalai village	1929	338 0 0	Brick in mortar	3 0	
		Polur Range.			
22 Rest-house at Thaniar	1902	150 0 0	Brick in mortar	3 0	
23 Patrakad village	1930	305 0 0	Rough stone in mortar ..	7 0	
24 Rest-house at Moolakad	1910	150 0 0	Brick in mortar	4 0	
25 Rest-house at Komittiyeri	1923	30 0 0	....	1 0	
26 Koyilur village	1925	119 13 10	Brick in mud	4 0	
27 Mandaparai	1925	196 0 0	....	8 0	
28 Nagakuttai draw well	..	209 0 0	Brick in mortar	..	
29 Kuttakarai village	1929	540 0 0	Do.	1 0	
30 Jadayanur village	1929	490 0 0	Brick in mud plastered in cement.	4 0	
31 Tube well at Komittiyeri	1919	1,335 0 0	Brick in mud	24 0	
32 Burgur village	1929–30	470 0 0	....	8 0	
33 Tube well at Mandaparai	1919	1,335 0 0	....	7 0	
34 Kallathur well	1941–42	369 0 0	....	0 8	Rural uplift.
35 Kil Komitteri well	Do.	530 0 0	....	0 8	Do.
36 Tekkamarathu well	Do.	610 0 0	....	1 0	Do.
37 Jamnamarathur well	Do.	993 0 0	....	8 0	Do.
		Tiruvannamalai Range.			
38 Range Officer's quarters at Tiruvannamalai.	1905	400 0 0	....	6 0	
39 Inspection shed at Tandrampet	1908	165 0 0	....	1 0	Sold to district board.
40 Rest-house at Thanipadi	1913	264 0 0	....	10 0	
41 Rest-house at Bheemarapatty	1919	130 0 0	....	3 0	
42 Inspection at Pudu-Chekkadi	1926	403 0 0	....	4 0	
43 Subordinates' quarters at Navakkollai ..	..	300 0 0	....	1 0	
44 Rest-house at Pavunjipattu	1910	91 0 0	....	4 0	
45 Ponniar Reserve Forest plantation well ..	1942–43	286 9 0	....	..	
46 Do. ..	1943–44	250 0 0	....	..	

SECTION 5—PAST YIELDS.

222. The following statement shows the outturn of sandalwood from regular fellings carried out in accordance with the prescriptions of the Sandal Working Plan :—

Statement showing the annual outturn of sandal wood from 1936–37 to 1946–47.

Year of extraction.	Coupe number.	Vellore range. Alleri series. Number of trees.	Vellore range. Alleri series. Yield of heart-wood. QR. LB. OZ.	Santavasal range. Thongumalai series. Number of tress.	Santavasal range. Thongumalai series. Yield of heart-wood. QR. LB. OZ.	Santavasal range. Amerdi series. Number of tress.	Santavasal range. Amerdi series. Yield of heart-wood. QR. LB. OZ.	Santavasal range. Nadanur series. Number of trees.	Santavasal range. Nadanur series. Yield of heart-wood. QR. LB. OZ.	Polur range. Veerappanur series. Number of trees.	Polur range. Veerappanur series. Yield of heart-wood. QR. LB. OZ.	Polur range. Komittiyeri series. Number of trees.	Polur range. Komittiyeri series. Yield of heart-wood. QR. LB. OZ.	Polur range. Patrakad series. Number of trees.	Polur range. Patrakad series. Yield of heart-wood. QR. LB. OZ.	Polur range. Mulakad series. Number of trees.	Polur range. Mulakad series. Yield of heart-wood. QR. LB. OZ.	Tiruvannamalai range. Tiruvannamalai series. Number of trees.	Tiruvannamalai range. Tiruvannamalai series. Yield of heart-wood. QR. LB. OZ.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1936–37	III	170	68 4 8	458	270 4 0	408	693 3 0	101	146 23 0	499	554 0 0	302	665 21 0	719	1,207 3 0	299	256 22 0	59	7 1 0
1937–38	IV	223	78 15 0	1,664	1,507 7 0	803	1,544 20 0	76	132 4 0	169	150 19 0	913	787 10 0	671	953 14 0	134	48 10 0	29	6 27 0
1938–39	V	17	4 19 0	230	336 20 0	298	704 10 0	106	106 27 0	41	37 27 0	189	387 5 0	583	677 21 0	160	208 4 0	2	0 8 0
1939–40	VI	66	55 10 0	117	110 14 0	284	627 23 0	293	347 27 0	14	7 11 0	17	23 20 0	682	1,459 6 0	20	71 2 0	No dead trees.	
1940–41	I	No dead trees.		316	264 17 0	249	492 0 0	39	59 17 0	103	156 27 12	29	38 3 4	645	1,244 14 12	119	89 2 0	15	0 2 9½
1941–42	II	No dead trees.		264	232 22 0	350	962 1 0	100	232 1 0	50	77 8 0	415	569 7 0	246	347 21 0	28	75 0 0	76	34 10 0
1942–43	III	Not worked.		Not worked.		Not worked.		Not worked.		Not worked.		Not worked.		Not worked.		Not worked.		Not worked.	
1943–44	IV	22	23 27 0	397	590 20 0	413	929 13 0	139	359 11 0	611	1,003 12 0	1,279	1,438 13 0	1,105	1,724 15 0	58	21 13 0	47	6 17 0
1944–45	V	Not worked.		68	102 2 0	147	294 19 0	145	650 19 4	41	33 15 0	250	538 3 0	438	681 7 0	119	52 23 0	22	6 16 5
1945–46	VI	85	97 18 0	96	156 19 0	105	210 16 0	157	152 25 0	20	20 15 0	70	134 2 0	243	624 27 0	27	69 0 0	8	1 2 0
1946–47	I	Not worked.		210	216 20 0	131	261 23 0	143	137 24 8	86	58 13 0	134	188 14 0	315	419 8 8	35	31 15 9	Not worked.	

N.B.—In 1942–43 no regular coupes were worked as the staff and labour were employed in extracting sandal from the spike areas.
The above figures do not include the quantity of sandal removed from the spike areas and from the enclosures.

223. It is not possible to furnish a statement showing the annual yield of bamboos, as the records do not show whether the quantities removed are cart-loads, etc. The revenue realized annually of the sale of bamboo coupes for the 11 years period is given in section 6 below.

224. *Fuel and small timber.*—The following statement shows the quantities of fuel and small timber removed annually from the various felling series (both prescribed by the working plan and special areas not prescribed by the working plan) :—

Statement of yield, fuel, small timber and charcoal from all the felling series from **1936–37** *to* **1946–47.**

Felling series.	1936–37. Area worked.	1936–37. Yield. Fuel.	1936–37. Yield. Timber.	1936–37. Yield. Charcoal.	1937–38. Area worked.	1937–38. Yield. Fuel.	1937–38. Yield. Timber.	1937–38. Yield. Charcoal.	1938–39. Area worked.	1938–39. Yield. Fuel.	1938–39. Yield. Timber.	1938–39. Yield. Charcoal.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	ACS.	TONS.	C.FT.	TONS.	ACS.	TONS.	C.FT.	TONS.	ACS.	TONS.	C.FT.	TONS.
REGULAR FELLING SERIES.												
Vellore Range.												
Komiar	90	240¼	..	..	42	136¾	..	..	76	61½	..	..
Usoor	78	367 31/40	..	..	70	211¾	..	..	66	67 17/20	..	..
Vellakal	56	134⅞	..	..	47	149¾	..	..	55	107	..	..
Thellai	88	187¾	..	..	58	271 7/10	..	..	84	136¾	..	..
Karungalthody ..	84	262	248	35½	66	172	700	27	64	187½	40	44½
Plantation East ..	14	224⅓	..	..	15	220	..	..	15	225	..	..
Plantation West ..	20	89 3/10	..	..	19	27½	140	4	19	67	..	..
Odugathur Range.												
Ambur	92	196	..	..	67	145¾	..	..	91	110½	..	..
Naikaneri	102	587¾	..	..	83	552½	..	..	86	468½	..	..
Panangatteri ..	..	..	..	..	..	..	..	..	..	..	..	..
Pallipattu	40	131	10	36	..	..	..	..	14	113	..	11½
Kuppampalayam ..	26	102	40	21½	50	127½	80	30	45	89½	..	14½
Asnampet	30	164¼	..	..	28	123	61	..	..	..	..	..
Thattankinar ..	54	199	..	..	20	340	..	..	37	234	..	..
Santavasal Range.												
Amerdi	26	113	..	..	28	96½	..	..	22	30½	..	..
Santhavasal	52	33½	..	..	40	189¾	..	..	83	328¼	..	..
Kornatagiri	42	310	220	..	78	620	..	..	36	324½	280	..
Polur Range.												
Thaniar	25	208¼	..	..	..	..	..	..	93	92½	..	..
Pullamedu	..	..	..	..	25	148	160	..	3	23½	120	1
Tiruvannamalai Range.												
Ponniar East ..	104	657½	..	..	82	792 4/5	..	137/140	103	873	..	3
RESERVE FELLING SERIES.												
Odugathur Range.												
Panangatteri ..	..	..	..	..	..	..	..	..	..	..	..	..
Kallapparai	..	..	..	..	..	..	..	..	..	..	..	..
Polur Range.												
Jambumalai	..	..	..	..	..	..	..	..	..	..	..	..
Tiruvannamalai Range.												
Ponninar West ..	..	..	..	..	..	..	..	..	..	..	..	..

Felling series.	1939–40. Area worked.	1939–40. Yield. Fuel.	1939–40. Yield. Timber.	1939–40. Yield. Charcoal.	1940–41. Area worked.	1940–41. Yield. Fuel.	1940–41. Yield. Timber.	1940–41. Yield. Charcoal.	1941–42. Area worked.	1941–42. Yield. Fuel.	1941–42. Yield. Timber.	1941–42. Yield. Charcoal.	1942–43. Area worked.	1942–43. Yield. Fuel.	1942–43. Yield. Timber.	1942–43. Yield. Charcoal.
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
	ACS.	TONS.	C.FT.	TONS.	ACS.	TONS.	C.FT.	TONS.	ACS.	TONS.	C.FT.	TONS.	ACS.	TONS.	C.FT.	TONS.
REGULAR FELLING SERIES—*cont.*																
Vellore Range—cont.																
Komiar	78	146¾	..	..	77	95¾	..	..	80	131½	..	..	87	79½	..	..
Usoor	58	49¾	..	..	53	44	..	..	71	181¼	20	..	60	72½	..	..
Vellakal	45	137¾	..	..	51	179¾	..	..	35½	76¼	..	..	{52 6½}	{200¾ 45½}	..	..
Thellai	84	93¼	..	..	79	208¾	..	..	66½	78¼	..	2	{93 19½}	{295⅛ 12}	..	..
Karungalthody ..	66	282	20	18¼	63	253	..	23½	32	56	17	..	36	102	..	..
Plantation East ..	12	222	..	..	16	234	100	..	15	505½	140	..	14	222	..	..
Plantation West ..	18	79	..	..	21	79¾	230	..	17	97½	340	..	18	84	..	..
Odugathur Range—cont.																
Ambur	73	203	20	..	62	105	..	..	84	142	81	17¼	90	256	..	..
Naikaneri	82	347½	..	..	97	172	985	..	101	120	..	..	102	195	..	..
Panangatteri ..	..	..	..	..	109	153½	..	8 1/5	125	222¼	..	18	85	131	..	..
Pallipattu	22	25	182	19	14	136	41	7	40	142	81	17¼	46	216	..	1½
Kuppampalayam ..	38½	60	81	11	36	45	..	5	45	106½	..	24	43	95¼	..	4½
Asnampet	..	..	..	..	14	205	..	..	63	34	..	..	71	389½	220	2½
Thattankinar ..	50	394	..	..	63	286	..	..	49	148½	..	..	68	154½	..	..
Santhavasal Range—cont.																
Amerdi	20	27½	..	..	26	160½	..	..	24	35½	..	..	19	61½	..	..
Santhavasal	50	353½	..	..	52	444	..	..	64	691	..	..	59	394	..	..
Karnatagiri	56	241	40	..	18	46	..	..	81	118	295	..	..	..	..	..
Polur Range—cont.																
Thaniar	85	73	..	..	31	66¼	80	..	62	181½	..	..	165	228	..	..
Pullamedu	40	82	360	..	20½	115¼	427 1/10	..	23	28	740	3½	29	145	130	..
Tiruvannamalai Range—coont.																
Ponniar East ..	100	909¼	3	..	96	785½	..	..	92	670	..	..	110	343	..	..
RESERVE FELLING SERIES—*cont.*																
Odugathur Range—cont.																
Panangatteri ..	..	..	..	..	..	..	..	..	..	..	..	..	45	91	..	..
Kallapparai ..	..	..	..	..	..	..	..	..	94	617	¼	..	49	160¾	..	18
Polur Range—cont.																
Jambumalai	..	..	..	..	..	..	..	..	..	..	..	..	42	25	..	8
Tiruvannamalai Range—cont.																
Ponninar West ..	..	..	..	..	..	..	..	..	49	328	..	..	46	85	..	..

Statement of yield, fuel, small timber and charcoal from all the felling series from **1936–37** *to* **1946–47—cont.**

Felling series.	1943–44.				1944–45.				1945–46.				1946–47.			
	Area worked.	Yield.			Area worked.	Yield.			Area worked.	Yield.			Area worked.	Yield.		
		Fuel.	Timber.	Char-coal.		Fuel.	Timber.	Char-coal.		Fuel.	Timber.	Char-coal.		Fuel.	Timber.	Char-coal.
	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)
	ACS.	TONS.	C.FT.	TONS.	ACS.	TONS.	C.FT.	TONS.	ACS.	TONS.	C.FT.	TONS.	ACS.	TONS.	C.FT.	TONS.
Regular Felling Series—cont.																
Vellore Range—cont.																
Komiar	70 92	31 45 }	120	219	80	½	..	97	118	69	2,400	5	116	188	..	..
Usoor	64	100 ..	.. ..	.. ..	76 58	465½ 67 }	..	..	109	561	..	..	53	458	..	..
Vellakal	104 ..	395½ ..	.. ..	.. ..	48 46	258 144 }	..	..	79	575¼	440	..	105	334	..	
Thellai	.. 185	.. 306	.. ..	.. ..	71 90	288½ 334 }	..	..	191	645¾	..	..	99	971	..	
Karungalthody ..	68 ..	4 ..	.. ..	114 ..	72 24	16½ ½	960 ..	58 15	59 61	.. ..	220 ..	.. 33 }	50	..	..	110
Plantation East ..	17½ 08½	200¼ 1,473¼	480 240	.. .. }	243	5,070½	..	..	56	1,125	..	..	43½	640	..	..
Plantation West ..	18½	85	..	..	176	3,663	..	..	113	2,065	..	..	..	..	..	..
Odugathur Range—cont.																
Ambur	201	132½	..	..	118	216	..	..	200	235	..	..	..	..	..	..
Naikaneri	191	746½	..	..	115	657	..	..	101	720	..	..	166	705	..	..
Panangatteri ..	169	414	..	..	117	333	..	..	164	795	..	..	200	730	..	..
Pallipattu	94	224½	..	2	153	540	..	..	172	416	..	7	156	624	..	..
Kuppampalayam ..	80	222½	..	171½	105	480	..	..	201	390½	..	3¾	214	535	..	..
Asnampet	138	175½	..	5	140	341¼	..	..	167	..	..	46½	150	..	..	35
Thattankinar ..	32	182	..	..	62	210	..	..	110	366½	..	..	102	429	..	..
Santavasal Range—cont.																
Amerdi	61½	92	..	..	52	36½	..	..	83	367	..	..	66	452	..	..
Santhavasal	112	798½	..	..	110	1,107½	..	..	81	813½	..	..	77	826	..	..
Karnatagiri	146	211	120	75	108	102	..	..	187	307½	..	..	138	188	..	..
Polur Range—cont.																
Thaniar	68	127	..	.. ..	138 ..	247½ ..	.. ..	.. ..	161 27	516¼ 92½ }	.. 92½	.. ..	235	400	..	..
Pullamedu	33	163½	..	..	70	179	40	1½	112	546½	820	..	155	761	360	..
Tiruvannamalai Range—cont.																
Ponniar East ..	102	355	..	..	198	466¾	..	..	188	1,202½	..	..	192	540	..	..
Reserve Felling Series—cont.																
Odugathur Range—cont.																
Panangatteri ..	102	137½	..	..	247	1,327¾	..	..	156	675	..	..	425	3,045	..	..
Kallaparai	40	180½	..	7	85	531¾	40	1½	121	765	..	..	105	355	..	..
Polur Range—cont.																
Jambumalai	32	18½	..	12½	42	90	200	..	64	275	..	..	70	156	263	..
Tiruvannamalai Range—cont.																
Ponuinar West ..	46	12	..	..	4	31½	..	..	79	289	..	..	105	419	..	..

224. *Statement of yield, fuel, small timber and charcoal from the special coupes not prescribed in the working plans.*

Name of series.	1942–43. Area worked.	1942–43. Yield. Fuel.	1942–43. Yield. Timber.	1942–43. Yield. Char-coal.	1943–44. Area worked.	1943–44. Yield. Fuel	1943–44. Yield. Timber	1943–44. Yield. Char-coal.	1944–45. Area worked.	1944–45. Yield. Fuel.	1944–45. Yield. Timber.	1944–45. Yield. Char-coal.	1945–46. Area Worked.	1945–46. Yield. Fuel.	1945–46. Yield. Timber.	1945–46. Yield. Char-coal.	1946–47. Area worked.	1946–47. Yield. Fuel.	1946–47. Yield. Timber.	1946–47. Yield. Char-coal.
	ACS.	TONS.	R.FT.	TONS.	ACS.	TONS.	R.FT.	TONS.	ACS.	TONS.	R.FT.	TONS.	ACS.	TONS.	R.FT.	TONS.	ACS.	TONS.	R.FT.	TONS.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Odugathur Range.																				
Munukkal	..	..	..	..	202	302½	..	..	102	300	..	..	264	1,830	..	..	145	1,365	..	..
Area between Pananga-teri Coupes V and VI.	..	..	..	..	69	198	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Vellakkal	..	..	..	..	..	..	..	..	97	390	..	..	176	845	..	..	..	..	..	..
Ambur R.F. Special Coupes.	..	..	..	..	..	..	..	..	96	636	..	..	20	585	..	..	75	90	..	..
Special area in Block I Ambur R.F.	..	..	..	..	..	..	..	..	..	..	..	..	200	1065	..	..	453	930	..	..
Kallaparai	..	..	..	..	..	..	..	..	..	..	..	..	100	400	..	..	112	510	..	..
Vellore Range.																				
Virinchipuram ..	44	162	..	..	99½	2,104	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Thiruvalam	130	184	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chenur	..	..	..	..	..	..	..	..	52	307¼	..	..	51	412½	..	..	..	..	..	..
Banavaram	..	..	..	..	..	..	..	..	56	210	..	..	..	..	..	..	..	..	..	..
Santavasal Range.																				
Malayalam	49	298	..	..	120½	182	..	..	108	1,333¾	..	..	109	1,445	..	..	105	1,970	..	..
Amerdi	25	50	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Santavasal	11½	50	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Polur Range.																				
Gillman	131	750	6½	96½	80	652½	2,860	5	106	1,091½	720	..	139	1,074	100	..	308	5,145	..	..
Thaniar	..	..	..	..	..	..	..	..	..	..	..	..	128	706½	..	..	..	..	..	..
Tiruvannamalai Range.																				
Veppur	116	157	20	8	95	316	..	..	92	691¼	..	..	205	..	..	82	108	190	..	30
Reddipalayam ..	145	74½	..	11½	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rayandapuram ..	..	..	..	..	..	..	..	..	..	..	..	..	98	565	..	..	178	900	..	..

225 *Minor forest produce.*—The yield of minor forest produce for eleven years ending with 1946–47 is given in the following statement :—

Statement showing the yield of minor forest produce from 1936–37 *to* 1946–47.

Year.	Per maund of 25 lb.														Per measure.			Per cart load.							
	Konnai bark.	Avaram bark.	Sural bark.	Nux vomica.	Tamarind.	Gall nuts.	Soap nuts.	Pungam.	Honey.	Beeswax.	Poovam.	Dividivi.	Kodukkapalli.	Veppam seeds.	Kattamanakku	Nellikkai.	Elendhai.	Quarry stones.	Woodapple.	Kavadi grass.	Thumbi leaves.	Murukkan leaves.	Palm leaves.	Beedi leaves.	Palm stacks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	20)	(21)	(22)	(23)	(24)	(25)	(26)
												Odugathur Ran.													
1936–37	..	1,929	..	..	2,265	..	678	45	..	..	..	..	..	..	..	..	..	..	½	..	6	1½	..	..	..
1937–38	..	65	..	..	125	180	..	118	..	..	210	..	..	..	..	..	..	..	..	..	10	200	..	..	..
1938–39	..	..	..	3	20	..	..	720	..	..	..	..	..	..	..	..	..	..	1	..	1	5	..	..	..
1939–40	1,045	440	..	..	200	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	..	..	..	..
1940–41	580	403	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	22	..	..	..	..
1941–42	..	508	..	..	39	..	60	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1942–43	..	6	..	51	30	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	165	..	..	..
1943–44	..	292	..	..	..	176	..	..	..	..	1	..	..	..	..	..	..	..	½	..	..	2	..	..	4
1944–45	..	..	..	..	381	44	202	..	1	215	..	..	..	..	..	10	..	..	34	..	..	14	..	..	..
1945–46	..	..	..	..	255	..	..	..	..	..	..	..	..	..	..	..	..	..	19	..	..	6	..	..	1
1946–47	..	..	..	..	35	..	80	..	..	..	40	..	..	..	..	..	..	..	8	..	..	7	..	..	..
													Vellore Range.												
1936–37	..	..	..	..	965	..	..	..	..	..	..	..	1,156	..	..	4,536	1,624	1,899	4	20¼	1	..	14	..	..
1937–38	..	..	..	..	21	..	251	..	..	..	..	67	863	..	..	..	..	2,339	169	20	3	..	68	..	29
1938–39	..	..	..	..	532	415	..	..	..	..	..	3	729	..	..	1,264	220	2,288	..	6	..	1	..	..	18
1939–40	880	..	..	..	138	40	4	1	..	..	420	1,820	485	..	..	..	..	1,807	1	22	..	23	57	..	9
1940–41	1,000	..	..	..	30½	18	..	..	..	..	..	88⅝	915	..	..	350	..	1,313	1	30	11	74	40	28	10½
1941–42	..	..	..	..	634	..	..	..	..	..	..	15	606	..	..	..	..	2,194	..	187	4	6	59	28	3
1942–43	..	67	..	..	25	..	..	..	½	⅞	..	..	259	19	..	..	..	1,927	10	9	..	16	21	..	25
1943–44	..	47	..	..	22	93	..	..	16	..	..	2	233	1	..	..	..	991	20½	10	12	½	19	..	1
1944–45	..	..	..	..	580	700	..	..	12	..	..	..	..	..	..	..	..	712	..	5	..	13	..	..	..
1945–46	..	..	..	..	40	..	..	..	..	..	..	..	..	..	..	..	..	747	..	1	..	5	2	24	..
1946–47	..	..	..	..	..	20	..	..	..	..	..	..	..	..	..	..	..	925	2	..	..	38	2	..	..

Santavasal Range.																											
1936-37	..	..	..	58	..	..	1,924½	1,604	10	10	..	..	..	..	..	..	..	3,316	128	..	½	..	1	12	..	..	..
1937-38	..	..	..	..	..	..	889	573	..	..	..	..	..	..	..	..	..	..	512	..	..	..	..	7	..	..	..
1938-39	..	..	..	..	..	..	1,601	1,918	..	..	..	..	..	..	..	..	..	..	1,238	..	..	..	..	..	..	..	..
1939-40	..	..	240	72	..	..	523	1,963	44	748	..	..	..	..	..	..	..	..	..	..	..	..	..	105	..	..	..
1940-41	..	..	800	..	..	..	2,169	728	..	6	1/12	1/3	..	..	..	..	..	..	..	..	..	..	1	1¾	..	..	..
1941-42	..	..	..	..	..	..	728	1,577	..	72	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1942-43	..	..	..	..	..	..	50	515	..	..	¾	½	40	..	..	½	..	..	..	..	..	..	..	..	..	..	..
1943-44	..	..	..	..	..	..	133	2,818	..	..	..	..	..	..	..	..	..	..	..	82	4	..	..	..	..	..	..
1944-45	..	..	..	..	..	..	..	336	..	..	..	..	..	..	..	..	..	20	5	167	..	..	..	1	..	..	..
1945-46	..	..	..	..	..	..	163	120	..	..	..	..	..	..	..	..	..	..	..	203	..	..	..	..	..	..	..
1946-47	..	..	..	..	..	..	359	295	..	..	..	..	..	..	..	..	..	..	..	145	..	..	..	..	..	..	
Polur Range.																											
1936-37	..	..	..	..	..	444	45	2,500	2	986	..	..	..	..	..	..	806	2,13,052	140	..	2½	..	..	..	..	..	..
1937-38	..	..	..	..	..	3,182	80	1,578	1,645	687	..	..	..	..	..	..	..	11,440	..	..	10	10	..	..	..	..	..
1938-39	..	..	1,848	..	..	171	844	1,818	717	64	..	..	..	..	..	..	45	1,176	..	..	..	..	3	..	..	..	..
1939-40	..	..	360	318	..	2,357	122	820	794	571	..	..	..	..	..	..	..	35	..	..	..	14	140	..	..	..	..
1940-41	..	..	..	..	..	46	2,234	3,724	..	1,622	..	..	..	..	..	..	..	13,242	300	..	5	..	..	..	..	..	..
1941-42	..	..	..	30	..	105	2.820	3,006	..	670	..	..	..	..	..	..	..	409	..	..	..	..	..	..	..	..	..
1942-43	..	..	..	..	..	136	6,832	2,456	..	..	1/2	⅛	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1943-44	..	..	..	..	..	..	610	3,612	10	..	..	..	146	..	..	..	80	..	..	..	..	..	..	..	..	..	..
1944-45	..	..	..	..	..	80	20	552	..	542	1	½	..	..	..	..	16	..	..	..	..	..	..	..	..	..	..
1945-46	..	..	..	..	..	4	4,176	1,000	3	..	..	..	443	..	..	..	..	4,304	..	..	1/5	..	..	..	..	..	..
1946-47	..	..	..	..	..	..	2,756	148	152	..	..	..	..	..	..	..	8	180	..	..	12	..	..	..	..		..
Tiruvannamalai Range.																											
1936-37	..	..	..	4,175	..	14	..	1,757	252	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1937-38	..	..	230	375	..	..	..	771	410	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1938-39	..	..	..	771	48	84	..	1,139	1,260	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1939-40	..	..	..	1,319	24	..	..	2,092	85	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1940-41	..	..	..	211	12	..	..	423	259	2,086	3	⅝	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1941-42	..	..	..	..	5	..	..	560	656	..	3	½	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1942-43	..	..	12	700	..	..	..	408	..	..	4-3/5	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1943-44	..	..	1,375	..	..	60	50	1,840	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1944-45	..	..	..	..	..	..	720	..	..	..	⅓	⅔	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1945-46	..	..	..	1,720	90	..	..	580	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1946-47	..	..	..	500	..	..	..	227	240	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

SECTION 6—PAST REVENUE AND EXPENDITURE.

226. The figures of revenue and expenditure for eleven years commencing from 1935–36 to 1945–46 are given in the statement below.

Statement showing the revenue and expenditure for the eleven years ending 1945–46.

REVENUE.

Year.	Sandalwood.		Fuel and small timber.		Bamboos.		Grazing.		Minor forest produce.		Miscellaneous.		Refunds.		Total Revenue less Refunds.
	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	RS.		RS.		RS.		RS.		RS.		RS.		RS.		RS.
1935–36 ..	35,583	20	25,914	15	50,018	28	26,231	15	28,432	16	16,163	9	4,380	2	1,77,961
1936–37 ..	35,478	20	12,144	7	42,994	24	26,420	15	31,229	18	28,129	16	..	..	1,76,394
1937–38 ..	45,564	22	12,534	6	70,543	33	28,266	13	28,402	13	30,437	14	3,850	2	2,11,896
1938–39 ..	40,578	22	11,740	6	58,849	32	17,745	10	29,523	16	30.236	17	5,631	3	1,83,040
1939–40 ..	33,832	23	11,380	8	42,173	28	16,397	12	20,309	14	26,817	17	1,740	1	1,49,168
1940–41 ..	34,269	21	9,932	6	59,513	35	16,818	11	21,665	13	27,176	16	2,291	1	1,67,082
1941–42 ..	83,806	46	18,625	10	47,229	26	15,802	9	6,818	4	13,082	7	2,433	1	1,82,929
1942–43 ..	1,53,572	60	32,943	13	36,480	14	16,093	6	7,488	3	10,622	4	2,279	1	2,54,919
1943–44 ..	2,22,426	57	63,648	16	54,543	14	17,200	4	22,521	6	13,018	3	2,414	1	3,90,942
1944–45 ..	1,77,002	34	1,28,069	37	54,207	16	17,412	5	16,614	5	17,719	5	2,724	1	3,48,299
1945–46 ..	94,044	30	1,22,275	39	42,689	14	17,172	6	18,715	6	18,749	6	2,257	1	3,11,387
Total for eleven years.	8,96,154	..	4,49,204	..	5,59,238	..	2,15,556	..	2,31,716	..	2,32,148	..	29,999	..	25,54,017
Annual average.	81,469	32	40,835	15	50,840	24	19,596	10	21,065	10	21,104	10	2,727	1	2,32,183

EXPENDITURE.

Year.	Establishment.		Exploitation.		Improvement or upkeep of forests.		Miscellaneous.		Total.	Surplus.
	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	RS.		RS.		RS.		RS.		RS.	RS.
1935–36	69,065	41	11,110	6	74,957	45	12,696	8	1,67,828	10,133
1936–37	67,485	81	4,773	6	11,400	14	..	..	83,658	92,736
1937–38	69,092	71	7,152	7	11,409	12	9,826	10	97,479	1,14,417
1938–39	71,683	71	4,066	4	15,620	16	8,249	8	99,618	83,422
1939–40	67,363	71	4,707	5	12,689	13	9,486	10	94,245	54,923
1940–41	65,866	79	3,803	4	8,898	10	8,694	10	87,261	79,821
1941–42	63,379	72	4,344	5	12,191	13	8,687	10	88,601	94,328
1942–43	66,862	60	15,531	14	21,194	19	7,843	7	1,11,430	1,43,489
1943–44	71,448	61	5,493	5	30,010	26	10,752	9	1,17,703	2,73,239
1944–45	75,126	43	4,420	3	79,750	45	15,480	9	1,74,776	1,73,523
1945–46	87,245	33	4,952	2	1,14,805	48	33,955	14	2,40,957	70,430
Total for the eleven years ..	7,74,614	..	70,351	..	3,93,923	..	1,25,668	..	13,63,556	11,90,461
Annual average	70,419	62	6,396	6	35,720	24	11,424	9	1,23,959	1,08,224

CHAPTER VI—STATISTICS OF GROWTH AND YIELD.

SECTION 1—SANDAL.

227. *Growing stock.*—The sandal in the reserves of this division has been stock-mapped by Mr. A. R. Brand by an adaptation of timber cruising method. The reserves were divided into a number of compartments by means of natural or permanent artificial boundaries. Compartments were subdivided into strips, five chains wide, running either north to south or east to west. Strip lines were not cleared, but were indicated on the ground by blazing trees and cutting occasional bushes, so that they could be followed without much difficulty. All sandal trees above the height of a man, i.e., above 5 feet 6 inches, were then counted along each strip and marked in on field sheets (enlarged to a scale of 16 inches to 1 mile from 4 inches Survey of India maps) at intervals of 10 chains. The stock-mapping thus proceeded in small units of 5 acres each. The following density classes were shown:—

Over 30 trees per acre	11 to 20 trees per acre.
21—30 trees per acre	6—10 trees per acre.
	5 trees and below.

These details were reduced and transferred to a blank sketch of 4 inches Survey of India maps which has been filed for permanent record.

As the situation of enclosures is marked in the working maps, and as each enclosure will be visited either annually or biennially and dead trees extracted, it was not considered necessary to enter into an analysis of the sandal growing in them. Further such analysis would have entailed much time and considerable expenditure.

The greater portion of the working circle lies on the Javadi plateau. The aggregate area is 113,068 acres, constituted, as follows :—

Range.	Area of sandal in — Reserves.	Area of sandal in — Enclosures.	Area of working circles.
	ACS.	ACS.	ACS.
Vellore	7,340	1,359	..
Odugathur	416	..	..
Santavasal	25,338	12,157	..
Polur	47,409	10,386	..
Tiruvannamalai	8,553	110	...
Total ..	89,056	24,012	113,068

228. *Yield of heartwood per tree.*—The following statement compiled from the control registers relating to extraction carried out between 1936–37 and 1946–47 in the Vellore, Santavasal, Polur and Tiruvannamalai ranges, shows the average yield of rough cleaned sandalwood per tree in the various six-inch girth classes. It has already been stated elsewhere that only dead trees were extracted. It is interesting to note that the yield per tree is appreciably higher in the Polur and Santavasal ranges. In the other two ranges sandal occurs in small patches to a limited extent.

Girth classes.	*Vellore range.* *Number of trees on which averages are based.*	*Vellore range.* *Average yield of heartwood per tree.*	*Santavasal range.* *Number of trees on which averages are based.*	*Santavasal range.* *Average yield of heartwood per tree.*	*Polur range.* *Number of trees on which averages are based.*	*Polur range.* *Average yield of heartwood per tree.*	*Tiruvannamalai range.* *Number of trees on which averages are based.*	*Tiruvannamalai range.* *Average yield of heartwood per tree.*	*Division.* *Number of trees on which averages are based.*	*Division.* *Average yield of heartwood per tree.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		QR. LB. OZ.		QR. LB. OZ.		QR. LB. OZ.		QR. LB. OZ.		QR. LB. OZ.
0— 6 inches.	81	0 2 14	322	0 6 14	704	0 4 6	34	0 2 7	1,141	0 4 2
6—12 ,,	215	0 9 4	3,190	0 15 11	4,706	0 13 11	124	0 4 8	8,235	0 10 12
12—18 ,,	174	0 18 6	3,084	1 4 12	4,049	1 9 2	59	0 13 15	7,366	0 25 9
18—24 ,,	75	0 25 3	1,180	3 9 13	1,409	3 26 4	23	0 7 15	2,687	2 3 4
24—30 ,,	26	1 21 2	317	6 7 2	423	6 17 6	11	0 3 15	777	3 19 6
30—36 ,,	9	0 24 0	94	8 8 3	115	10 1 14	4	0 8 0	222	4 24 8
36—42 ,,	2	2 21 8	28	11 10 12	22	12 21 6	..	..	52	6 20 6
42—48 ,,	1	4 21 0	3	25 18 5	2	18 11 8	1	0 6 0	7	7 16 13
48—54 ,,	..	..	..	..	2	30 1 0	..	..	2	7 14 4
54—60 ,,	..	..	..	..	1	38 15 0	..	..	1	9 17 12

229. The ratio of diameter to yield of heartwood is expressed in the graph on the opposite page which has been drawn from figures recorded in columns (1) and (11) of the foregoing statement. Girth classes above 42 inches have been omitted as the number of trees in each are insufficient for the production of accurate data.

230. *Yield of heartwood per acre.*—The average yield of heartwood per acre obtained in the Vellore, Santavasal, Polur and Tiruvannamlai ranges during nearly two complete felling cycles of the last plan works out to 14 oz., 12 lb. 4 oz., 7 lb. 11 oz. and 5 oz. respectively. In working out these averages non-sandal areas, which were included in coupes for convenience of working, have been omitted. Actually nearly two complete felling cycles were gone through during the currency of the working plan. In 1942–43, regular coupes were not worked but instead spiked and wind-fallen trees were extracted. In the subsequent year the arrear coupe was also worked.

231. *Mortality in sandal.*—The following statement gives the mortality per cent of sandal in its transition from one diameter class to another. The number of living trees in each diameter class [column (2)] has been extracted from Appendix VI (reserves only) of Mr. C. C. Wilson's Sandalwood Working Plan for the Javadi and Yelagiri hills. The periods of transition from one diameter class to another [column (4)] have been obtained from Graph No. IV in Appendix X of the same plan.

Calculation of mortality per cent.

Diameter classes (in inches).	*Number of living trees in the diameter class.*	*Gross mortality in transition to higher diameter class.*	*Period of transition from one diameter class to the next (years).*	*Annual mortality in transition.*	*Annual mortality per cent expressed against lower diameter class.*
(1)	(2)	(3)	(4)	(5)	(6)
3	116,247				
4	87,121	29,126	4½	6,472	5·57
5	62,876	24,245	4	6,061	6·96
6	47,786	15,090	4	3,773	6·00
7	27,947	19,839	4	4,960	10·38
8	18,619	9,328	4½	2,073	7·42
9	11,514	7,105	5½	1,292	6·94
10	5,480	6,034	8	755	6·56
11	3,685	1,795	11	163	2·97

The uniformity in the annual mortality per cent throughout the period, with the exception of that which takes place from the 6 to 7-inch and 10 to 11-inch diameter classes, is striking. The mortality during the transition from the 10 to 11-inch diameter classes should not be regarded as accurate as the length of the period, 11 years, is only an interpolation from the incomplete end of the age-diameter curve. The comparatively high mortality occurring between this 6 to 7 inch diameter class is curious and it is interesting to note that in the case of North Salem there is also a rise in the mortality per cent at this stage.

SECTION 2—FUEL SPECIES.

232. *Rotation.*—It was observed by Mr. A. R. Brand, that the coppice regrowth in the oldest coupes worked on a 30-year rotation up to that time, was disappointing and indicated an increase in rotation.

233. An attempt to collect figures as a guide to the determination of the correct rotation was made by taking height and girth measurements of some 5,000 coppice shoots of representative species in 62 coupes in four localities covering a range of ages from 15 to 35 years. An abstract of the figures is given below :—

Age of coppice in years.	Average number of shoots per stool.	Average measurements of the most vigorous shoot.	
		Girth in inches.	Height in feet.
(1)	(2)	(3)	(4)
15	4·0	5·0	16·0
16	3·5	6·8	16·4
17	3·4	6·4	15·7
18	3·7	6·6	16·0
19	4·2	7·5	16·2
20	3·6	7·0	16·6
21	3·3	7·5	16·3
22	3·1	8·2	16·0
23	3·0	8·6	16·0
24	3·0	9·0	16·0
25	3·4	8·7	15·5
26	3·3	9·0	15·9
27	2·8	10·1	16·7
28	2·6	9·7	14·7
29	1·9	13·0	16·2
30	3·2	13·2	18·0
31	4·0	9·2	17·6
32	3·6	9·4	17·0
33	5·1	10·5	19·1
34	3·8	11·9	21·0
35	3·7	11·9	21·0

Mr. Brand says, " It cannot be claimed that these figures help in leading us to a definite conclusion. They are too inconsistent, but the adoption throughout the Fuel working circle, except in the two Palar plantation felling series of the longer of the two rotations now in force—that is 40 years—is clearly indicated on general grounds." Hence he fixed the rotation as 40 years.

PART II.

Future management discussed and prescribed.

CHAPTER I—BASIS OF PROPOSALS.

SECTION 1—GENERAL OBJECTS OF MANAGEMENT.

234. *The objects of management* may be summarized as follows :—

(i) Systematic exploitation of the existing crop of sandal, fuel, bamboo and minor produce to produce revenue to the State and to maintain the forest in a continued state of maximum productivity ;

(ii) exploitation of all dead sandal trees at regular intervals to obtain the maximum yield of heartwood per acre ;

(iii) to regulate the supply of fuel and bamboo with reference to the requirements of neighbouring towns and villages ;

(iv) to satisfy the requirements of the local population in respect of their agricultural, domestic and pastoral needs ;

(v) to protect and improve the existing growth of sandal and other valuable species ; and

(vi) to realize such other revenue as may be obtained from the forests.

235. Thus, the prescriptions will provide for the exploitation, conservation and improvement of the forest and at the same time meet the demands of the people.

SECTION 2—METHODS OF TREATMENT TO BE ADOPTED.

236. The following methods of treatment will be adopted in the various types of forest :—

(i) *Sandal.*—Improvement felling involving the extraction of dead sandal trees only and of the maintenance and improvement of the sandal-growing stock by rigid protection.

(ii) *Fuel.*—Simple coppice with the reservation of sound minor forest produce-yielding trees.

(iii) *Bamboos.*—Selection felling subject to variation in the matter of the number of culms to be retained in each clump according to the silvicultural needs.

(iv) *Minor forest produce.*—Annual lease of the right to collect the minor forest produce on the basis of area in each farm.

(v) *Green leaf manure.*—Removal of green manure leaves under permit from selected areas.

(vi) *Grazing.*—By issue of grazing permits for cattle to graze in forests (except in such localities as have been specifically closed to grazing) on prepayment of grazing fees.

SECTION 3—WORKING CIRCLES, THEIR AREA AND DISTRIBUTION—REASONS FOR THEIR CONSTITUTION.

237. In pursuance of the objects of management set forth in section 1, six working circles have been formed as follows :—

(i) *Sandal Working Circle.*—This working circle covers 112,750 acres and comprises of all the sandal-bearing areas of the division.

(ii) *Fuel Working Circle.*—This working circle covers 94,458 acres and includes all suitable and accessible areas.

(iii) *Bamboo Working Circle.*—This working circle covers 189,770 acres of the bamboo forest in the division.

(iv) *Minor Forest Produce Working Circle.*—This working circle covers 44,407 acres comprising of 18 blocks situated in localities.

(v) *Green Leaf Manure Working Circle.*—This working circle covers 44,407 acres comprising of 18 series in the division.

(vi) *Grazing Working Circle.*—This working circle covers the whole division with the exception of the Banavaram reserved forest, the Ambur and the seven Palar river plantations. The area open to grazing will vary from year to year as fuel coupes will be closed in the year of felling and for three years thereafter.

SECTION 4—PERIOD OF WORKING PLAN AND THE NEXT REVISION.

238. This working plan will be in force for fifteen years, from 1st April 1949 to 31st March 1964.

239. *The next revision.*—Even if the revision is delayed, it will be a simple matter to extend the prescriptions of this plan for some years more, the present series of sandal and bamboo coupes so continued in sequence while there is no difficulty with fuel coupes as they have been allocated, to last even after the expiry of this plan.

CHAPTER II—WORKING PLAN FOR THE SANDAL WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE, AREA AND CHARACTER OF THE VEGETATION.

240. *General constitution and area.*—The Sandal Working Circle covers all sandal-bearing areas in the reserved forests of the division and the following enclosures :—

(*a*) The sandal-bearing enclosures on the Javadi Hills in the Vellore, Santavasal and Polur ranges.

(*b*) The unassessed lands and porambokes in the Akkarapatti village on the Kalroyan Hills of Tiruvannamalai Range.

The major portion of the working circle lies on the Javadi plateau. The aggregate area is 112,753 acres, situated as follows :—

Range.	Area of sandal in	
	Reserved forests.	Enclosures.
(1)	(2)	(3)
	ACS.	ACS.
Vellore	7,155	1,359
Odugathur	416	..
Santavasal	25,208	12,157
Polur	47,409	10,386
Tiruvannamalai	8,553	110
Total	88,741	24,012

241. *Character of the vegetation.*—The composition and condition of the crop have been fully described in Chapter II of Part I ; so, a few brief remarks here with reference to sandal will suffice.

242. The sandal on the Javadis is generally well grown and healthy, while that in the plains is mostly of small size and not so vigorously grown. On the Javadis, the best growth of sandal is often found in, or on the fringes of, high bamboo forest—*Bambusa arundinacea.* Biggest sandal trees were noticed along the footpath from Pelamattu to Sathampattu and their measurements are as follows :—

Serial number.	Girth.	Height.	Serial number.	Girth.	Height.
	INCHES.	FEET.		INCHES.	FEET.
1	50	35	5	44	35
2	59	30	6	55	30
3	61	40	7	66	45
4	52	45	8	51	40

243. In certain areas in plains forest, where fuel is of primary importance and sandal also occurs, the sandal and fuel working circles overlap each other. The situation of such areas can be located on the key map (burnt Sienna lines overlapping the yellow wash) and further studied by placing the sandal and fuel working maps side by side.

SECTION 2—ANALYSIS AND VALUATION OF THE CROP.

244. Stock-mapping and enumeration of sandal trees was done at the time of the last working plan under the following categories :—

Over 30 trees per acre,
From 21 to 30 trees per acre,
From 11 to 20 trees per acre,
From 6 to 10 trees per acre,
From 5 trees and below per acre.

As there has been no appreciable changes in the condition of the sandal growing stock since the preparation of the last working plan, it was considered not necessary to again stock-map the sandal areas at the present revision of the working plan.

However, in order to find out whether sandal is actually spreading or not, 40 ten-acre sample plots have been laid out in the sandal-bearing reserved forests and measurements recorded in the manner described below :—

Each sample plot has been demarcated on the ground with cairns at four corners, which are white-washed. The plots are serially numbered and are given the dates of enumeration on a small board, which is fixed to a tree. The sandal trees are measured at breast height and are classified into the following girth classes :—

0″— 6″	19″—24″	37″—42″
7″—12″	25″—30″	43″—48″
13″—18″	31″—36″	49″—54″

The trees enumerated are given a white band at breast height with white-lead paint and a cross mark to show the exact place for taking measurement. The measured trees are numbered with white paint. The following statement gives the situation and details of enumeration of sandal trees in the sample plots :—

Statement showing girthwar list of sandalwood trees enumerated in the sample plots.

Plot number and range.	Reserve in which situated.	Locality.	Number of trees under each girth class. 0″–6″	7″–12″	13″–18″	19″–24″	25″–30″	31″–36″	37″–42″	43″–48″	49″–54″	Total.
1 Polur	Virappanur	North-west of Mandaparai rest house	34	83	59	72	39	8	7	..	..	302
2 Do.	Do.	South-west of Mandaparai	4	90	181	150	65	26	7	2	..	525
3 Do.	Do.	South of Mandaparai	15	111	145	94	58	20	5	..	..	448
4 Do.	Do.	North of Jadayanur	7	55	47	28	19	7	2	..	1	166
5 Do.	Do.	South of Virappanur	24	82	96	53	16	2	2	1	..	276
6 Do.	Do.	South of Alanjanur	35	230	200	66	36	12	..	..	..	579
7 Do.	Do.	East of Alanjanur	142	546	270	73	22	4	3	..	..	1,060
8 Do.	Do.	West of Nellinarathur	8	56	83	49	14	19	2	2	..	233
9 Do.	Do.	North-west of Chinthalur	80	116	84	25	10	1	..	..	..	316
10 Do.	Do.	South of Jambodi	16	57	38	14	7	2	..	..	..	134
11 Do.	Do.	North-east of Mullippattu	13	117	88	24	5	1	..	..	..	248
12 Do.	Patrakadu	East of Koyilur	4	17	44	12	10	2	1	2	..	92
13 Do.	Do.	North-west of Vedathope	7	46	58	38	10	4	..	..	..	163
14 Do.	Do.	Patrakadu spike area	4	16	29	16	6	3	..	..	..	74
15 Do.	Do.	Junction of Patrakadu-Komutteri road and rest-house approach road.	2	2	..	..	..	..	..	..	..	4
16 Do.	Do.	Pudur spike area	42	92	49	13	3	2	..	..	..	201
17 Santavasal	Malaiyalam	Junction of common range boundary between Polur and Santavasal ranges.	18	18	28	11	10	4	1	2	..	92
18 Polur	Patrakadu	North-east of Ambattankollai	55	187	91	38	15	9	..	1	1	397
20 Do.	Do.	South-east of Vedathope	20	105	78	39	12	2	2	..	..	258
21 Santavasal	Puthur	South of Thongamalai	30	75	44	18	15	3	..	..	..	185
22 Do.	Arasampatti	South-east of Selathur	12	90	68	24	6	1	..	..	..	201
23 Do.	Do.	South of Puliyamarathur	18	75	69	30	10	4	1	..	..	207
24 Do.	Do.	Kattiyapattu spike area	42	128	151	79	16	4	1	1	..	422
25 Do.	Do.	North-west of Pudukuppam	34	105	110	72	25	12	4	1	..	363
26 Do.	Do.	West of Nayakkanur	29	215	168	64	10	3	..	..	..	489
27 Do.	Do.	North-east of Nayakkanur	18	126	146	73	19	3	..	..	..	385
28 Do.	Tellai	North-east of Kauliyur	72	105	67	32	12	2	1	..	..	291
29 Do.	Do.	East of Nekkini	..	106	201	129	53	9	3	..	..	501
30 Do.	Puttur	East of Changadu	62	241	71	25	7	1	..	..	..	407
31 Do.	Do.	South-west of Chinanur	33	150	117	5	14	10	9	2	1	387
32 Do.	Do.	North-east of Panamarathur	16	24	23	6	..	3	1	..	..	73
33 Do.	Do.	North of Mel Namimuttu	41	165	86	13	14	4	..	..	..	323
34 Do.	Do.	South-east of Muttanattur	136	149	64	29	9	11	1	..	..	399
35 Do.	Do.	South of Nadanur	17	113	100	49	19	7	6	..	..	311
36 Do.	Malaiyalam	South-east of Palathur	2	13	19	29	12	4	1	4	..	84
37 Do.	Do.	East of Nipalampathi	35	51	45	23	14	1	..	..	..	169
38 Do.	Tellai	West of Nipalampathi	17	44	47	18	16	1	..	..	..	143
39 Polur	Periyamalai	South-west of Thanjar rest house	60	85	11	1	..	..	..	..	..	157
40 Do.	Do.	South-east of Thaniar rest-house	103	9	..	..	..	..	..	..	..	112
		Total	1,325	4,161	3,328	1,604	637	211	60	19	3	11,348

245. These sample plots shall be carefully maintained by the District staff. At the next revision of the working plan it is to be seen, with reference to the enumeration now made in the forty sample plots, whether sandal has actually increased in girth appreciably or not. These forty sample plots should be protected against fire by cutting a line 30 feet wide all round.

246. As the situation of enclosures is marked on the working circle maps, and as each enclosure will be visited either annually or biennially, and dead trees in them extracted, it was not considered necessary to enter into an analysis of the sandal growing in them.

SECTION 3—METHOD OF TREATMENT.

247. *Silvicultural system.*—The system to be followed will be selection system and will consist in the removal of dead sandal trees only, and in the maintenance and improvement of the growing stock by rigid protection.

248. The only valuable part of sandal tree is the scented heartwood, which is used chiefly for the distillation of sandal oil. The oil content is higher in the roots than in the aerial portions of the tree ; so the exploitation of sandal trees necessarily involves uprootal. The production of heartwood commences at an early age and marketable heartwood may generally be found in trees of 6 inches in girth and over. As the value of heartwood lies in its oil content, the size of the trees extracted is of no practical importance, except that it may be taken as an indication of the probable outturn of heartwood—*vide* graph in paragraph 229 above.

249. *Division of the area into felling series.*—The working circle, excluding the area of enclosures, is divided into nine felling series. Owing to the patchy distribution of sandal and the need for adopting, as far as possible, natural features for coupe boundaries, it has been necessary to include within the limits of felling series considerable areas containing no sandal. The extent and distribution of the species is shown on the sandalwood working maps. Details of areas of the felling series are shown in the following statement :—

Area in acres.

Range. (1)	Felling series. (2)	Sandal. (3)	Non-sandal. (4)	Total. (5)
Vellore	Alleri	4,877	2,694	7,571
Santavasal	Amerdi	5,809	1,691	7,500
	Thongamalai	4,219	1,587	5,806
	Nadanur	4,464	7,438	11,902
Polur	Veerappanur	6,269	2,821	9,090
	Komattiyur	5,568	1,246	6,814
	Patrakad	10,016	5,784	15,800
	Moolakad	9,456	6,249	15,705
Tiruvannamalai ..	Tiruvannamalai	2,700	5,853	8,553
	Total ..	53,378	35,363	88,741

250. The total area of enclosures in each range has been given in paragraph 240 and the area of each enclosure is furnished in the tabular statement of felling (paragraph 260).

251. *Felling cycle.*—A felling cycle of six years will be adopted for the reserved forests. Enclosures will be examined annually and dead trees extracted. Where the aggregate area of the enclosures falling within the jurisdiction of a forester is too large to be gone through in one year, it may be gone over biennially. The reason for working enclosures annually or biennially, as the case may be, is to ensure the prompt extraction of trees which are, for the most part, growing in cleared fields under cultivation or not.

252. *Allocation of coupes.*—Each felling series has been divided into six coupes, one of which will be worked in sequence every year. The formation of coupes made in the last working plan in each felling series with reference to density classes on an equi-productive basis has been adhered to.

253. *Calculation of the yield.*—The annual yield depends on the number of trees which die each year and the quantity of heartwood obtained from them. It is not possible to estimate the former with any degree of accuracy as the heartwood content of individual tree is variable.

At the time of the last working plan there were 684,204 healthy sandal trees and 10,894 dead sandal trees. During the currency of the last working plan (from 1936–37 to 1946–47), 21,026 dead sandal trees were extracted, which yielded about 380 tons of rough cleaned sandalwood as shown below :—

Year.	Number of trees extracted.	Yield.	Year.	Number of trees extracted.	Yield.
		QRS.			QRS.
1936–37	3,015	3,869	1944–45	1,230	2,361
1937–38	4,682	5,190	1945–46	811	1,469
1938–39	1,626	2,464	1946–47	1,054	1,316
1939–40	1,493	2,703			
1940–41	1,515	2,348		21,026	30,348
1941–42	1,529	2,530			or 380 tons
1942–43	No extraction.				approximately.
1943–44	4,071	6,098			

Besides the above, 4,952 dead sandal trees yielding about 146 tons were extracted from enclosures during the 11-year period. Thus the total outturn of sandalwood obtained both from reserved forests and enclosures from dead sandal trees was 526 tons or 48 tons per year on an average.

In addition to the above trees 25,281 spiked trees were also extracted. But for the purposes of calculation of normal yield only the extraction of dead sandal trees in reserved forests and enclosures should be taken as a fairly approximate basis and not the extraction of spiked trees also.

Based on the above consideration the annual yield for the future may be estimated as follows for each range :—

	TONS.
Santavasal Range	19·08
Polur Range	28·22
Vellore Range	0·42
Tiruvannamalai Range	0·07
.. Total ..	47·79 or 48 tons.

SECTION 4—METHOD OF EXECUTING FELLINGS.

254. *Regulation of operations.*—All operations connected with the exploitation of sandal will be carried out departmentally, one coupe in each felling series and a definite area of sandal bearing enclosures being exploited every year. The sequence of coupes and the position of the enclosures are shown on the sandal working circle maps and the years of extraction are given in the tabular statement of fellings in section 5 below. Enclosures are denoted by the names of villages situated in them.

255. *Clearing coupe boundaries.*—Natural and permanent artificial boundaries and lines already existing on the ground have, as far as possible, been selected for coupe boundaries. Where this has not been done, lines 10 feet wide will be cleared for each coupe

in the year prior to felling. As these lines are only to be re-cleared the expenditure may not be more than Rs. 3 per mile. The following statement gives the length of artificial boundaries of coupes to be cleared each year and the estimated expenditure.

Year.	*Range.*	*Felling series.*	*Coupe number.*	*Length of line to be cleared in miles (to first decimal place).*	*Estimated expenditure at Rs. 3 per mile.*		
					Coupe.	*Range.*	*Division.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				MILES.	RS. A. P.	RS. A. P.	RS. A. P.
1949–50 ..	Vellore ..	Alleri	IV	0·5	1 8 0	1 8 0	
	Santavasal ..	Thongamalai ..	IV	1·4	4 3 0	..	
		Nadanur ..	IV	1·3	3 15 0	8 2 0	
	Polur	Veerappanur ..	IV	0·7	2 2 0	2 2 0	
	Tiruvannamalai.	Tiruvannamalai.	IV	0·3	0 15 0	0 15 0	
							12 11 0
1950–51 ..	Vellore ..	Alleri	V	3·8	11 7 0	11 7 0	
	Santavasal ..	Nadanur ..	V	10·8	32 7 0	32 7 0	
	Polur	Veerappanur ..	V	4·1	12 5 0	..	
		Moolakad ..	V	2·4	7 3 0	19 8 0	
	Tiruvannamalai.	Tiruvannamalai.	V	4·8	14 7 0	14 7 0	
							77 13 0
1951–52 ..	Vellore ..	Alleri	VI	7·8	23 7 0	23 7 0	
	Santavasal ..	Thongamalai ..	VI	1·1	3 5 0	..	
		Nadanur ..	VI	0·5	1 8 0	..	
		Do. ..	VI	18·0	54 0 0	58 13 0	
	Polur	Veerappanur ..	VI	1·9	5 11 0	..	
		Patrakad ..	VI	1·9	5 11 0	..	
		Moolakad ..	VI	5·2	15 10 0	27 0 0	
	Tiruvannamalai.	Tiruvannamalai.	VI	2·0	6 0 0	6 0 0	
							115 4 0
1952–53 ..	Vellore ..	Alleri	I	3·4	10 3 0	10 3 0	
	Santavasal ..	Thongamalai ..	I	2·0	6 0 0	..	
		Amerdi	I	0·4	1 3 0	7 3 0	
	Polur	Veerappanur ..	I	0·3	0 15 0	..	
		Komattiyur ..	I	4·0	12 0 0	..	
		Patrakad ..	I	2·4	7 3 0	..	
		Moolakad ..	I	7·0	21 0 0	41 2 0	
	Tiruvannamalai.	Tiruvannamalai.	I	0·7	2 2 0	2 2 0	
							60 10 0
1953–54 ..	Vellore ..	Alleri	II	2·1	6 5 0	6 5 0	
	Santavasal ..	Thongamalai ..	II	1·2	3 10 0	..	
		Amerdi	II	3·3	9 15 0	..	
		Nadanur ..	II	0·1	0 5 0	13 14 0	
	Polur	Veerappanur ..	II	0·3	0 15 0	..	
		Komattiyur ..	II	0·5	1 8 0	..	
		Patrakad ..	II	0·9	2 11 0	..	
		Moolakad ..	II	2·4	7 3 0	12 5 0	
	Tiruvannamalai.	Tiruvannamalai.	II	2·0	6 0 0	6 0 0	
							38 8 0
1954–55 ..	Vellore ..	Alleri	III	6·9	20 11 0	20 11 0	
	Santavasal ..	Thongamalai ..	III	0·3	0 15 0	..	
		Amerdi	III	7·3	21 15 0	22 14 0	
	Polur	Veerappanur ..	III	1·3	3 15 0	..	
		Patrakad ..	III	3·5	10 8 0	..	
		Moolakad ..	III	2·2	6 10 0	21 1 0	
	Tiruvannamalai.	Tiruvannamalai.	III	1·6	4 13 0	4 13 0	
							69 7 0
			Total ..	124·6			374 5 0

256. *Exploitation.*—Extraction will be confined to dead trees, both standing and fallen, including all stumps and roots. All green fallen or broken stems and branches will also be removed. Detailed procedure to be followed in felling, cleaning, classification and disposal of sandal trees is contained in the pamphlet entitled "Rules regarding selection felling, cleaning, classification and disposal of sandalwood and method of maintaining depot accounts and other registers."

257. *Minimum exploitable size.*—As already stated, only dead sandal trees will be extracted irrespective of girth. Trees which are found to contain no heartwood should not be despatched to the sale depot and no root that contains heartwood of more than the size of half a rupee should be left in the ground.

258. *Restriction of output.*—As exploitation will be regulated entirely by area, no limit is imposed on the annual output.

SECTION 5—TABULAR STATEMENT OF FELLINGS TO BE MADE.

259. *Coupes.*—The following statement shows the coupes to be worked each year in the different felling series :—

Year.	Coupe number.	Vellore range.		Santavasal range.				Polur range.						Tiruvannamalai range.						Division.	
		Alleri series.		Thongamalai series.		Amerdy B series.		Nadanur series.		Veerappanur series.		Komattiyur series.		Patrakad series.		Moolakad series.		Tiruvannamalai series.			
		Sandal area.	Non-sandal area.	Sandal area.	Non-sandal area.	Sandal area.	Non-sandal area.	Sandal area.	Non-sandal area.	Sandal area.	Non-sandal area.	Sandal area.	Non-sandal area.	Sandal area.	Non-sandal area.	Sandal area.	Non-sandal area.	Sandal area.	Non-sandal area.	Sandal area.	Non-sandal area.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
		ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.
1949–50 .. 1955–56 .. 1961–62 ..	IV	553	268	677	123	1,034	24	725	1,034	1,044	356	1,006	2	1,334	1,275	1,364	1,349	419	501	8,156	4,932
1950–51 .. 1956–57 .. 1962–63 ..	V	892	369	687	433	846	9	854	3,140	516	373	576	34	1,325	581	1,374	850	602	631	7,672	6,420
1951–52 .. 1957–58 .. 1963–64 ..	VI	845	613	786	362	927	116	1,408	2,395	1,666	593	826	556	1,130	154	1,936	1,384	216	1,928	9,730	8,101
1952–53 .. 1958–59 ..	I	517	449	804	199	881	562	542	304	843	702	1,563	617	2,009	1,433	1,868	1,737	712	1,906	9,739	7,909
1953–54 .. 1959–60 ..	II	1,084	219	580	187	710	375	490	141	1,180	484	829	37	1,269	48	1,154	817	406	644	7,708	2,952
1954–55 .. 1960–61 ..	III	942	819	763	205	1,405	605	445	424	1,020	313	768	..	2,949	2,293	1,770	112	345	243	10,408	5,014

260. *Enclosures.*—The following enclosures will be examined and dead trees extracted in the manner indicated in paragraph 130 :—

Enclosure. Name.	Enclosure. Area.	Each forester. Total area.	Each forester. Headquarters of Forester.
(1)	(2)	(3)	(4)
	ACS.	ACS.	
Vellore Range—	(*a*) *Annually.*		
1 Yerikollai	12		
2 Karapanankollaiyur	12		
3 Nellimarathukollai	6		
4 Nameless, west of No. 3	7		
5 Alleri	286	397	Anicut.
6 Marudavallimodur	34		
7 Avacherikollai	39		
8 Katarikollai	1		
1 Jarathukollai	870	962	Sholavaram.
2 Yerimodu	92		
Santavasal Range—			
1 Yelavandapudur	419		
2 Nikkini	178		
3 Selathumadiki	220		
4 Chinnanur	267		
5 Sinnapanaparai	45		
6 Niplampatti	127		
7 Amerdi	28	1,612	Amerdi.
8 Palaparampattu	40		
9 Sathampattu	54		
10 Nameless, between Thavaraimarathur and Nikkini.	10		
11 Thavaraimarathur	160		
12 Kolayam	64		
1 Boganur	100		
2 Nellimandai	8	526	Santavasal.
3 Periayavali	126		
4 Thumbakadu	292		
Polur Range—			
1 Jonur	20		
2 Nameless, north-east of Natchakkallu hill.	20		
3 Melmarathur	28		
4 Mandaparai	256		
5 Nameless, east of Mandaparai	24		
6 Nameless, between Mandaparai and Jadayanur.	17	2,577	Burgur.
7 Jadayanur	22		
8 Nameless, between Jadayanur and Veerappanur.	8		
9 Veerappanur, etc.	1,710		
10 Pudupattu	472		
1 Kilchepalli	72		
2 Palveri	113	241	Athimur.
3 Kilthattiyapattu	56		
1 Odamangalam	243		
2 Thumbakollai	67		
3 Periamalai	59		
4 Koilanur (part)	151		
5 Pattankoil	18		
6 Kuttankarai	152		
7 Manjuthu, etc.	290		
8 Killathur	72		
9 Patrakad	34	1,438	Patrakad.
10 Pudur, Mamarathur	32		
11 Melchapalli	53		
12 Kolleri	9		
13 Kondikallur	37		
14 Ambattankollai	49		
15 Vedatope	54		
16 Nameless, west of Vedatope	10		
17 Iramayanur	34		
18 Pelavadi	74		

Enclosure. Name. (1)	Enclosure. Area. (2) ACS.	Each Forester. Total area in acres. First, third, fifth, seventh and ninth years. (3)	Each Forester. Total area in acres. Second, fourth, sixth, eighth and tenth years. (4)	Each Forester. Headquarters of Forester. (5)
(b) Biennially.				
Santavasal Range—				
1 Nameless, north of Elluparai	8			
2 Elluparai	41			
3 Nameless, south of Elluparai	10	2,586	..	Thongamalai.
4 Puduparai	16			
5 Nayakanur, Muthanur, etc.	2,511			
1 Thongamalai	1,180			
2 Sinnakottansetty and Periakottansetty.	175			
3 Mulpadukuppam	12	..	1,558	Do.
4 Koraimadavu	57			
5 Kudikam	134			
1 Periapanaparai	160			
2 Nadanur (part) north of Kalimadugu Ar.	1,454			
3 Palathur	154			
4 Nagalur	146			
5 Vediappankoil	28			
6 Nameless, west of Vediappankoil ..	10			
7 Elandampattu	60	2,950	..	Nadanur.
8 Murukumandai	74			
9 Puliyankuppam	458			
10 Melkanavaur	152			
11 Kilkanavaur	36			
12 Eriyur	48			
13 Pudupattuvali	20			
14 Velethumbe	150			
1 Nadanur (part) south of Kalimadugu Ar.	2,925	..	2,925	Do.
Polur Range—				
1 Komattiyur	2,492			
2 Koilanur (part)	35	2,961	..	Komattiyur.
3 Mullipattu	170			
4 Athiyanur	264			
1 Nellimarathur, Koilur, Athipattu, etc.	3,169	..	3,169	Do.

SECTION 6—SUBSIDIARY SILVICULTURAL REGULATIONS.

261. *Tending.*—No general tending is prescribed. Creepers are nowhere really very bad and the isolated cases, can be dealt with by the marking coolies at the time of enumeration.

262. *Artificial regeneration of sandal.*—No artificial regeneration was prescribed in the last working plan. However, it is proposed in the present working plan to open a few sandal propagation centres as an experimental measure, as there are certain localities in this division, where sandal (*Santalum album*) could be raised with success. This work is proposed to be done under proper estimate and not by the beat subordinates free of cost. Suitable areas have been proposed and is given in paragraph 274.

263. *Selection of site.*—It is e mphasised that no attempt at artificial regeneration of sandal will be justified in or near spiked sandal areas. Areas included in fuel working circle should not be selected for sandal regeneration. On the other hand, suitable areas in bamboo and minor forest produce working circles may be ideal for such regeneration. The propagation centres should be situated, as far as possible, on either side of a river or a stream, because of the fertility of the soil, availability of moisture and because birds congregate in such places and help in such dispersal of the sandal seeds ; and also because the seed is carried down by the flood and deposited in fertile soil in the lower reaches.

Sandal being an obligatory root parasite requires throughout its life vigorous hosts to live on. So, the plots must be situated in fertile soil containing vigorous and healthy trees which, would serve as hosts and also give enough shade, as sandal requires overhead shade in the first three to five years of its existence.

264. *Size and number of propagation plots.*—Each year, one plot of one acre will be taken up in each of Tiruvannamalai and Santavasal ranges.

265. *Demarcation.*—The annual plot will be surveyed and demarcated by line 5 feet wide on the ground to be cleared of all growth and be normally bound by not more than four straight lines. This work should be completed by the end of December.

266. *Preparation of the area.*—The plots selected will be cleared of all undergrowth soon after the demarcation, so that the cut material may get dry, to give a good burn by the middle of April. On no account the existing trees are to be cut. After the burn, the soil should be raked to get the ash mixed up with the soil.

267. *Staking.*—No sandal should be introduced within 3 feet of any tree species. The number of stakes to be fixed depends upon the existence of host trees. However, the aim should be to have 20 well distributed sandal trees per acre for final crop. With this end in view, sufficient number of stumps should be planted allowing a wide margin for casualties. The minimum espacement must be 12 feet × 12 feet.

268. *Planting.*—The method adopted will be stump planting. Stumps shall be planted firm, at each stake in crowbar holes during the month of June and July. Simultaneously stumps of *Mundulea suberosa* (Pullavaram) may be planted in the same hole so that they might serve as primary hosts. If not, dhall should be sown all round the stakes. Stumps prepared from 2 to 2½ years old seedlings are found to give very good results. Stumps are to be prepared in the same manner as for teak, but we may not get a length of 9 inches for the roots. The stumps should have their side roots clipped off. As nursery stumps will not be available for the first two years, the Provincial Silviculturist, may be asked to arrange for the supply of the required stumps. If no stumps could be obtained through the Provincial Silviculturist, 5 to 6 seeds may be dibbled at each stake, along with dhall to serve as primary hosts. The planting shall be done under the personal supervision of the Range Officer.

269. *Replacement of casualties.*—Casualties will be replaced throughout the first growing season.

270. *Fencing.*—The propagation plots must be effectively fenced to a height of 6 feet with thorns to prevent browsing by cattle and wild animals.

271. *Watering.*—On account of the unsettled condition of rainfall in this district, the plants should be watered at least once a week during breaks in the rains till the plants are well established. There will not be any difficulty in obtaining water as the propagation plots will be situated on banks of a river or stream.

272. *Weeding and tending.*—If weeds are likely to give lateral protection against the sun, they should not be removed for any reason. If the weeds are to be removed, they should be cut back and not uprooted. When the plants grow to a sapling size, enough overhead light should be let in by judicious lopping of the surrounding non-sandal trees. The trees, on no account, should be cut. The lopping of side branches is all that is required.

273. *Control.*—The propagation plots should be marked on the sandalwood working maps. All the plots should be serially numbered with tar in a blaze made on an adjacent tree. Separate journal shall be maintained for each of the sandal propagation centres. A sample form of the journal is given in Appendix VIII.

274. *Localities proposed for formation of propagation centres.*—The localities suitable for forming propagation centres are given below. The actual sites for the centre should be selected by the Range Officers and approved by the District Forest Officer.

1 Santavasal Range ..	Malayalam Reserve Forest.	On either side of Pasimaduvu Ar.
2 (*a*) Tiruvannamalai Range.	Valasamalai Reserve Forest.	On either side of Vannathiparai Ar.
(*b*) Do.	Do.	On either side of Akarakattu Odai.
(*c*) Do.	Nattampalli Reserve Forest.	On either side of Nattampalli Ar.

275. *Seed and seed supply.*—As spike disease is not transmitted through seed there is no question of getting seeds collected from spike free areas. Enough seeds can be collected from this division. The seeds should preferably be from the autumn crop as fresh seed is preferred for sowiing, though the seed does keep for eight months.

276. *Nursery.*—Nursery should be formed to get enough stumps for planting. As stumps prepared out of 2 to 2½ years old seedlings are found to give very good results, the nursery should be formed well in advance, i.e., two years prior to the year of planting in the propagation centres.

277. *Selection of site and formation of beds.*—The nursery should be selected on the best available soil close to the subordinates' quarters and by the side of a stream or a well in order to have proper attention and water facilities.

The soil should be well dug to a depth of 1 foot and beds 4 feet × 3 feet × 1 foot should be formed as usual.

278. *Pre-treatment of seeds.*—Seeds are to be collected preferably from the autumn crop. The pulp must be removed and the seeds soaked in water for 24 hours. The seeds must be well stirred and those that float must be rejected. After 24 hours soaking, the seeds should be well dried in the sun for one day. Afterwards the seeds should be stored in tins for sowing.

279. *Sowing.*—When the beds are ready dibble the treated sandal seeds at the rate of 3 to 4 seeds at each point, the points being about 3 inches apart on lines running at right angles to the length of the bed. The dibbling lines may be about 4 inches to 6 inches apart. Simultaneously with dibbling dhall seeds may also be sown in the beds to serve as temporary hosts. As a protection against redents, the sandal seeds should be poisoned with *Acoras calamus* (Vasambu) before sowing.

280. *Maintenance.*—The nursery should be well maintained free from all weeds, watering must be done periodically until the seeds germinate and the seedlings get well established. The beds should be well protected from browsing with an effective fence. If found necessary, a pandal may be put up to protect the seedlings from the afternoon sun.

SECTION 7—OTHER REGULATIONS.

281. *Fire-protection.*—The sandal working circle is so extensive that the question of the general fire protection of sandal areas is the same as that of the division as a whole and is dealt with in Chapter VIII—(Miscellaneous regulations). Special provision, must, however, be made for sandal growing in dense bamboo forest on the Javadi plateau, where the bamboo has flowered and died. There is grave danger, should fire get into such areas, of the sandal trees being very severely damaged or killed. Such areas which are in the opinion of the District Forest Officer, susceptible to danger from fire, should be demarcated by a 30 feet cleared line and it should be kept cleared of combustible materials during the hot weather.

282. The overlapping of sandal and bamboo working circles is marked in the key map accompanying this plan by alternating green and yellow horizontal lines. Localities where sandal occurs in dense bamboo forest are shown in the sandal working maps. The density of the sandal is also shown.

283. *Measures for prevention of the spread of spike disease.*—The spread of the spike disease in this division has been dealt with in detail in paragraph 158 (*f*) of Part I, Chapter V. The preventive methods, such as girdling, painting with Atlas solution, lopping, etc., have not produced any beneficial results. Such methods need not therefore, be continued. Instead, the following method will be adopted :—

Immediately a spike tree is detected, the fact should be reported to the Range Officer, who should take immediate steps to extract the tree and bring it into stock. The importance of detecting fresh attacks immediately they occur and reporting them at once should be impressed on all subordinates and severe disciplinary action should be taken in cases, where this is not done.

The location of the spike tree should be marked on the sandalwood record map. A sketch of the locality together with the list of trees extracted should be sent to the District Forest Officer.

284. *Retail sales.*—The present system of selling sandalwood billets in Vellore and Tiruvannamalai ranges only will continue. As no sales were effected in Odugathur, Santavasal and Polur ranges, these ranges will not be supplied with billets.

285. The District Forest Officer will obtain from the sale depot at Tiruppattur from time to time quantities of sandalwood billets, 6 to 12 inches in girth and 9 to 12 inches in length, for distribution to Range Officers, for private sale, as follows :—

Range Officer, Vellore	200 billets.
Range Officer, Tiruvannamalai	250 ,,

No single billet should exceed 5 lb. in weight and the quantities noted above should be regarded as the maximum which each Range Officer can have in his custody at a time.

286. Each billet will be numbered and weighed before it leaves the sale depot and its number and prices marked on it in indelible pencil. The price will be calculated at the rate per ton of sandalwood fixed by the Chief Conservator of Forests from time to time and shall be rounded off to the nearest anna. The prices so fixed will not be subject to reduction on account of dryage during storage. Every billet will be stamped at both ends with the District Forest Officer's hammer.

287. A list showing the serial numbers, weights and prices of the billets will accompany each consignment. A stock register shall be maintained by each Range Officer. The register will show the serial numbers, weights and prices of the billets, dates of receipt and disposal and the names of the purchasers. A minimum stock of 25 billets will be ept by each Range Officer.

CHAPTER III—WORKING PLAN FOR THE FUEL AND SMALL TIMBER WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE, AREA AND CHARACTER OF THE VEGETATION.

288. *General constitution and area.*—The fuel and small timber working circle is 94,458 acres in extent. The more degraded types of forest have been excluded from this working circle and formed into separate felling series for the supply of green leaf manure. Some of the inaccessible areas, omitted in the last working plan, have now been included. Thirty three out of forty felling series are situated in the plains, where they extend as a marginal belt around the lower slopes of the Javadi Hills. Five felling series are situated on the Naickaneri plateau near Ambur, in Odagathur range and two felling series in Komettiyur plateau in Polur Range. The seven Palar river plantations have been grouped together to form two separate felling series and this has been dealt with in detail in paragraph 294.

289. *Character of the vegetation.*—The forest is of the mixed deciduous type. The density varies from locality to locality, with occasional ill-shaped tree. A brief description of this type of forest together with the species met with has already been given in Chapter II of Part I.

SECTION 2—METHOD OF TREATMENT.

290. *Silvicultural system.*—The system to be adopted will be *simple* coppice with the reservation of sandal, minor forest produce and bark-yielding trees. Coppice regeneration in fuel coupes will be supplemented by artificial regeneration by the "Kumri" method which is prescribed in paragraphs 318 to 334.

291. *Division of the area into felling series.*—The working circle is divided into forty felling series and, out of these, thirty-eight felling series have been described as 'Regular' series, while the remaining two will be treated as 'Reserve' series. These two reserve felling series are situated on the Komattiyur plateau and these series are not to be worked unless there is an acute demand for firewood; and that too after obtaining territorial Conservator's approval. The area, description and situation of each series is shown in the following statement :—

Serial number and name of felling series. (1)	*Total area of the felling series.* (2)	*Area available for working.* (3)	*Reserve or reserves in which situated.* (4)	*Description of the felling series.* (5)
			(a) Regular Series.	
Vellore Range—	ACS.	ACS.		
1 Komiar	3,078	1,858	Arasampet	With minor alterations these series remain the same as the old ones of the same name.
2 Usoor	2,577	1,388	Arasampet and Kailasagiri ..	
3 Vellakal	1,956	1,058	Do. ..	
4 Thellai	3,324	1,716	Thellai	....
5 Karungalthody	2,462	1,418	Arasampet and extension ..	The old Karungalthody series minus a small portion to the east of it.
6 Tiruvallam (Plantation East).	690	646	Kilminnal, Vannivedu and Thiruvalam plantation with river accretions.	Kilminnal, Vannivedu and Thiruvalam plantations.
7 Virinchipuram (Plantation West).	758	499	Virinchipuram, Vikramachi, Senur and Ammundi plantation with river accretions.	Virinchipuram, Ammundi, Vikramachi and Senur plantations.
Odugathur Range—				
8 Vinnamangalam	1,950	849	Ambur and Vellakkal	The series is in two bits. The area lies to the east of Vellakallu pallam in Ambur Fuel and Vellakal reserves plus two small bits to the west of it.
9 Ambur	3,661	2,377	Ambur and Shanankuppam ..	That part of the old Ambur Felling Series north of the stream passing through Sikkujonai enclosure plus a new area to the north-west around Uppamparai Kollai.
10 Naickaneri	3,620	2,329	Ambur	That part of the old Naikaneri Felling Series to the south of the stream passing through Sikkujonai enclosure.

Serial number and name of felling series.	*Total area of the felling series.*	*Area available for working.*	*Reserve or reserves in which situated.*	*Description of the felling series.*
(1)	(2)	(3)	(4)	(5)
	ACS.	ACS.		
			(a) *Regular Series*—cont.	
Odugathur Range—*cont.*				
11 Panangatteri, North ..	3,728	2,005	Ambur	Part of the old Panangatteri Series excluding that bit south of the Panangatteri enclosure plus new areas to the north and south of it.
12 Panangatteri, South ..	2,226	935	Ambur and Ambur Fuel	That portion of the old Panangatteri Reserve Series plus a new area to the south of it.
13 Munukkal	2,211	716	Ambur	The portions to the south of the old Panangatteri Reserve series and west of old Kallaparai series.
14 Kallaparai	2,120	1,308	Do.	The old Kallaparai Reserve Series plus new areas to the north and north-west of it.
15 Kuppampalayam	2,008	1,012	Ambur and Shanankuppam ..	The old Kuppampalayam Series plus a new area to the north-east of it.
16 Pallippattu	1,712	961	Ambur	The old Pallipattu Series.
17 Asanampet	2,884	1,796	Karuthamalai	The old Asanampet Series.
18 Karuthamalai	2,415	2,012	Karuthamalai and Ambur ..	The portion to the south of Kannikanar up to the divisional boundary in Karuthamalai Reserve and portion to the west of Karuthamalai Reserve in Ambur Reserve.
19 Tattankinar, North ..	1,767	1,348	Karuthamalai	The portion north of Tattankinar and in between old Arasanpet and Tattankinar Felling Series.
20 Tattankinar, South ..	2,138	2,138	Do.	The portion to the south of river Tattankinar up to the north of Thirtham enclosure. To the east of it is the old Tattankinar Felling Series.
21 Tattankinar, East	2,685	1,931	Do.	The old Tattankinar Felling Series plus a new area in between Sethaponam Ar and Nadugudda Valley, i.e., east of Thirtham enclosure.
Santhavasal Range—				
22 Amerdi	1,087	557	Thellai and Malayalam	Same as the Amerdi Series.
23 Santhavasal	2,671	1,714	Santhavasal and Malayalam ..	The old Santhavasal Series plus new areas to the north and s uth of Shenbagatl ope enclosure.
24 Karnatagiri	3,557	2,350	Karnatagiri and Santhavasal ..	Same as the old Karnatagiri Series.
25 Malayalam	606	..	Malayalam	Th area to the south of Amerdi Fuel Felling Series and east of Amerdi Ar. This series will have rest for 28 years.
Polur Range—				
26 Thaniar	3,976	2,222	Periamalai	The old Thaniar Series plus a new area to the north-west of it on either side of Pillai Ar.
27 Pullumedu	1,372	736	Moolakad	The old Pullimedu series plus a new area to the south of the series and north of Jambumalai series.
28 Jambumalai	1,239	885	Do.	The old Jambumalai Series.
29 Arasampet	1,205	1,205	Arasampet extension and Virappanur.	Area lying to the south of Karungalthody Series and south of the common boundary between Polur and Santhavasal ranges up to Mullupatti. Part of the series i.e., the eastern bit lies in Virappanur Reserved Forest. The other part lies to the east of Arasampet Ar along the western slopes of Arasampet Extension Reserved Forest.
Tiruvannamalai Range—				
30 Ponniar, East	3,902	2,282	Ponniar Reserved Forest ..	The old Ponniar East Series.
31 Ponniar, West	2,199	1,663	Do. ..	The old Ponniar West Reserve Series.
32 Veppur, East	2,310	1,323	Do. ..	The area lying to the west of Ponniar river and east of Veppur Chekodi enclosure.

Serial number and name of felling series. (1)	Total area of the felling series. (2)	Area available for working. (3)	Reserve or reserves in which situated. (4)	Description of the felling series. (5)
	ACS.	ACS.		
			(a) Regular Series—cont.	
Tiruvannamalai Range—*cont.*				
33 Veppur, West	2,788	2,788	Ponniar Reserved Forest ..	The area lying to the west of Veppu Chekkadi enclosure and east of the path from Reddipalayam to Chengam which is the common felling series boundary between Reddipalayam and Veppar West Series.
34 Reddipalayam	2,823	2,370	Do. ..	The area to the west of the path from Reddipalayam to Chengam which is the common boundary between Reddipalayam and Veppar West Series.
35 Rayandapuram	1,558	806	Rayandapuram	The series is in two bits one to the west of Narinjipattu and the other around Chinna Pattarai enclosure.
36 Perunkolathur Swamimalai.	1,688	1,688	Perunkolathur Swamimalai ..	The eastern bit of Perunkolathur Swamimalai Reserved Forest lying to the south of Navakollai and east of Vediyappan Koil.
37 Bimarapatti	2,487	2,487	Valasamalai and Nattarapalli ..	The series is in three bits. The first bit is the northern bit of Valasamalai Reserved Forest lying to the south of Tetarai odai. The second bit is to the west of Bimarapatti-Achekkodi footpath in Valasamalai Reserve Forest and the third is to the eastof Bimarapatti Achekkodi footpath in the Nattaruppalli Reserved Forest up to Attipadi.
38 Pavunjipattu	2,487	2,487	Valasamalai and Nattampalli ..	Major portion of Pavunjipattu Reserved Forest except small portions to the west and north-east of the reserve.
Polur Range—				
1 Komattiyur	2,502	1,248	Veerappanur	The series is in two bits. First bit lies to the north of the divisional boundary between Vellore East and Vellore West divisions and south of Peria Ar and west of Komattiyur. Second but lies between Veerappanur and Komattiyur enclosures.
2 Patrakad	2,986	2,986	Patrakad	The series is in two bits. First bit is to the east of Koilur and west of Mamarattur. The second bit is to the south of Jivimarathur and east of Attiyanur.

The boundaries of the felling series have been marked in the fuel working maps accompanying this working plan.

292. *Rotation.*—No data are available for fixing the rotation with reference to maximum fuel production. It is, therefore, prescribed emperically and on general grounds and fixed at thirty-five years except for the two Palar river casuarina plantations in Vellore range, for which the rotation will be ten years with a view to replace these plantations by *Pithecolobium dulce* and *Prosopis juliflora*—fast-fuel-yielding species.

293. *Size and allocation of coupes.*—The average size of the coupe in each of the regular felling series has been obtained of dividing the available area in the felling series by the balance number of years in the rotation. Though the period of this working plan is fifteen years, coupes have been selected in the regular felling series and marked in the fuel working circle maps for the whole rotation. The selection of coupes in the two Reserve felling series has been left to the discretion of the District Forest Officer, as the position and size of the coupe will depend upon the demand that may arise, but in no case shall the size of the coupe exceed one thirty-fifth the area of the felling series. The area of the two reserve felling series are to be found in the statement given in paragraph 291.

294. *The Palar plantations.*—The seven Palar river plantations and the river accretions have been divided into two fuel felling series, which will be henceforth known as Tiruvalam and Virinchipuram series (instead of the Palar East and West) as shown below :—

Serial number and name of plantation.	Area of plantation.	River accretions.	Total.
	ACS.	ACS.	
Tiruvalam Series—			
1 Kilminnal	151	..	151
2 Vannivedu	57	17	74
3 Tiruvallam	460	4-2/3	464-2/3
	668	21-2/3	689-2/3
Virinchipuram Series—			
1 Virinchipuram	253	24	277
2 Ammundi	163	58½	221½
3 Vikramachi	129	..	129
4 Senur	130	..	130
	675	82½	757½

295. All the above mentioned plantations excluding Vikramachi and Senur have been converted into casuarina plantations between 1942–43 and 1946–47 as per Mr. R. H. Mitchell's scheme sanctioned in the Salem Circle Conservator's No. R. Dis. 1659/44-C, dated 11th September 1944.

Particulars of the areas planted in the two series are as follows :—

Name of plantation.	1942–43. ACS.	1943–44. ACS.	1944–45. ACS.	1945–46. ACS.	1946–47. ACS.
Tiruvallam Series—					
1 Kilminnal	..	..	..	51	56
2 Vannivedu	..	..	57	..	..
Do. accretions	..	..	..	..	17
3 Tiruvallam	66	130	132	135	..
Do. accretions	..	..	..	..	4-2/3
Virinchipuram Series—					
1 Virinchipuram	17	44	117	75	..
Do. accretions	..	..	..	..	24
2 Ammundi	..	..	..	83	80
Do. accretions	..	..	..	..	58½

296. To start with, these plantations showed a promise of success but in later years they gradually deteriorated and several trees died. The present stocking is so poor as to justify their being regarded as almost failures. Though various causes are attributed for the failure nothing definite is known yet. Under the circumstances, it is not proposed to continue the planting of casuarina. During the period of this working plan it is proposed to regenerate the five Palar river plantations and their river accretions with suitable fuel species. This subject is dealt with in detail under artificial regeneration.

297. *Calculation of the yield.*—The yield of fuel in tons per acre and of small timber in cubic feet separately with some modifications after actual field inspection and is given in columns (2) and (3) of the

The area of all the coupes to be worked in each of the regular felling series is also given, so that the yield of

Name of felling series.	Anticipated yield per acre. Fuel.	Small timber.	Area of coupes—Coupe number.						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	TONS.	C.FT.							
									(a) REGULAR SERIES.
Vellore Range.									
1 Komiar	8	1	C. No.	XVIII	XIX	XX	XXI	XXII	XXIII
			Area.	87	86	86	85	82	80
2 Usoor	6	..	C. No.	XVIII	XIX	XX	XXI	XXII	XXIII
			Area.	63	65	62	63	64	53
3 Vellakal	2	..	C. No.	XIX	XX	XXI	XXII	XXIII	XXIV
			Area.	48	49	49	50	50	47
4 Thellai	8	..	C. No.	XIX	XX	XXI	XXII	XXIII	XXIV
			Area.	80	75	80	74	81	74
5 Karungalthody	6	4	C. No.	XX	XXI	XXII	XXIII	XXIV	XXV
			Area.	68	68	63	66	65	63
6 Tiruvallam (Plantation East)	Particulars given separately.								
7 Virinchipuram (Plantation West) ..	Do.								
Odugathur Range.									
1 Vinnamangalam	4	..	C. No.	VIII	IX	X	XI	XII	XIII
			Area.	26	27	26	26	29	27
2 Ambur	5	12	C. No.	XVII	XVIII	XIX	XX	XXI	XXII
			Area.	108	110	106	105	111	106
3 Naickaneri	5	12	C. No.	XVIII	XIX	XX	XXI	XXII	XXIII
			Area.	106	111	103	108	109	98
4 Panangatteri North	5	1	C. No.	XVII	XVIII	XIX	XX	XXI	XXII
			Area.	89	103	101	99	93	98
5 Panangatteri South	8	1	C. No.	XI	XII	XIII	XIV	XV	XVI
			Area.	33	32	33	33	33	36
6 Munukkal	5	..	C. No.	XIII	XIV	XV	XVI	XVII	XVIII
			Area.	26	26	26	27	24	28
7 Kallaparai	8	6	C. No.	XII	XIII	XIV	XV	XVI	XVII
			Area.	51	50	50	51	52	52
8 Kuppampalayam	4	1	C. No.	XVI	XVII	XVIII	XIX	XX	XXI
			Area.	46	40	43	45	43	42
9 Pallipattu	4	3	C. No.	XVI	XVII	XVIII	XIX	XX	XXI
			Area.	45	44	44	42	42	44
10 Asnampet	4	1	C. No.	XIX	XX	XXI	XXII	XXIII	XXIV
			Area.	80	80	80	77	83	
11 Karuthamalai	6	..	C. No.	III	IV	V	VI	VII	VIII
			Area.	64	64	58	58	63	61
12 Tattankinar North	6	..	C. No.	III	IV	V	VI	VII	VIII
			Area.	42	40	40	45	40	40,
13 Tattankinar South	6	..	C. No.	I	II	III	IV	V	VI
			Area.	60	62	61	58	60	60
14 Tattankinar East	5	..	C. No.	XVI	XVII	XVIII	XIX	XX	XXI
			Area.	80	84	84	82	85	82
Santhavagsal Range.									
1 Amerdi	6	..	C. No.	XIX	XX	XXI	XXII	XXIII	XXIV
			Area.	27	27	28	24	27	25
2 Santhavasal	5	..	C. No.	XIX	XX	XXI	XXII	XXIII	XXIV
			Area.	85	80	76	88	80	88
3 Karnatagiri	.2	..	C. No.	XV	XVI	XVII	XVIII	XIX	XX
			Area.	113	110	110	116	100	106
4 Malayalam	..	..	Rest.						
Polur Range.									
1 Thaniyar	6	5	C. No.	XX	XXI	XXII	XXIII	XXIV	XXV
			Area.	99	98	101	98	105	107
2 Pullumedu	5	4	C. No.	XVIII	XIX	XX	XXI	XXII	XXIII
			Area.	35	34	32	35	32	31
3 Jambumalai	6	3	C. No.	XI	XII	XIII	XIV	XV	XVI
			Area.	32	33	32	33	32	33
4 Arasampet	6	..	C. No.	I	II	III	IV	V	VI
			Area.	36	37	38	25	37	35
Tiruvannamalai Range.									
1 Ponniar East	5	..	C. No.	XVIII	XIX	XX	XXI	XXII	XXIII
			Area.	96	101	105	101	103	106
2 Ponniar West	5	..	C. No.	XII	XIII	XIV	XV	XVI	XVII
			Area.	63	61	63	64	63	64
3 Veppur East	5	..	C. No.	X	XI	XII	XIII	XIV	XV
			Area.	47	48	45	42	46	48
4 Veppur West	5	..	C. No.	I	II	III	IV	V	VI
			Area.	81	80	78	77	79	79
5 Reddipalayam	5	..	C. No.	V	VI	VII	VIII	IX	X
			Area.	85	85	89	89	86	86
6 Rayandapuram	6	..	C. No.	VI	VII	VIII	IX	X	XI
			Area.	26	28	25	27	29	28
7 Perunkolathur Swamimalai.	5	..	C. No.	I	II		IV	V	VI
			Area.	48	48	47	45	46	48
8 Bheemarapatty	10	..	C. No.	I	II	I I	IV	V	VI
			Area.	67	72	70	70	70	73
9 Pavunjipattu	6	..	C. No.	I	II	III	IV	V	VI
			Area.	99	101	101	97	103	102
									(b) RESERVE
Polur Range.									
1 Komattiyur..	Coupes not allocated.								
2 Patrakad	Do.								

based on the actuals of last 11 years working (1936–37 to 1946–47) has been calculated for each felling series following statement :—

each coupe can easily be determined.

Area of coupes—Coupe number—*cont.*

(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
XXIV 89	XXV 87	XXVI 80	XXVII 88	XXVIII 88	XXIX 88	XXX 80	XXXI 82	XXXII 79	XXXIII 80	XXXIV 84	XXXV 86
XXIV 61	XXV 61	XXVI 58	XXVII 59	XXVIII 64	XXIX 60	XXX 62	XXXI 61	XXXII 60	XXXIII 60	XXXIV 59	XXXV 63
XXV 46	XXVI 43	XXVII 48	XXVIII 46	XXIX 45	XXX 48	XXXI 48	XXXII 50	XXXIII 52	XXXIV 49	XXXV 48	XXXVI 50
XXV 79	XXVI 78	XXVII 80	XXVIII 78	XXIX 77	XXX 78	XXXI 75	XXXII 77	XXXIII 78	XXXIV 81	XXXV 70	XXXVI 80
XXVI 67	XXVII 68	XXVIII 61	XXIX 64	XXX 63	XXXI 67	XXXII 62	XXXIII 62	XXXIV 69	XXXV 62	XXXVI 60	XXXVII 64
XIV 27	XV 24	XVI 24	XVII 28	XVIII 26	XIX 24	XX 30	XXI 29	XXII 31	XXIII 27	XXIV 26	XXV 27
XXIII 119	XXIV 107	XXV 109	XXVI 110	XXVII 108	XXVIII 108	XXIX 110	XXX 110	XXXI 110	XXXII 108	XXXIII 104	XXXIV 100
XXIV 100	XXV 101	XXVI 110	XXVII 106	XXVIII 94	XXIX 107	XXX 104	XXXI 109	XXXII 114	XXXIII 104	XXXIV 112	XXXV 108
XXIII 97	XXIV 92	XXV 90	XXVI 89	XXVII 90	XXVIII 90	XXIX 85	XXX 86	XXXI 86	XXXII 89	XXXIII 89	XXXIV 87
XVII 32	XVIII 33	XIX 33	XX 33	XXI 34	XXII 31	XXIII 31	XXIV 32	XXV 34	XXVI 31	XXVII 31	XXVIII 26
XIX 25	XX 26	XXI 21	XXII 26	XXIII 25	XXIV 23	XXV 24	XXVI 23	XXVII 23	XXVIII 25	XXIX 24	XXX 24
XVIII 50	XIX 51	XX 51	XXI 49	XXII 53	XXIII 52	XXIV 49	XXV 51	XXVI 49	XXVII 51	XXVIII 49	XXIX 51
XXII 41	XXIII 45	XXIV 49	XXV 51	XXVI 49	XXVII 55	XXVIII 65	XXIX 48	XXX 44	XXXI 40	XXXII 46	XXXIII 43
XXII 42	XXIII 44	XXIV 41	XXV 44	XXVI 44	XXVII 47	XXVIII 41	XXIX 48	XXX 46	XXXI 44	XXXII 45	XXXIII 46
XXV 98	XXVI 86	XXVII 82	XXVIII 78	XXIX 77	XXX 77	XXXI 77	XXXII 80	XXXIII 79	XXXIV 85	XXXV 89	XXXVI 77
IX 60	X 63	XI 64	XII 60	XIII 60	XIV 61	XV 61	XVI 59	XVII 61	XVIII 63	XIX 69	XX 66
IX 40	X 41	XI 40	XII 42	XIII 45	XIV 45	XV 41	XVI 45	XVII 42	XVIII 45	XIX 41	XX 39
VII 60	VIII 62	IX 59	X 62	XI 59	XII 59	XIII 61	XIV 61	XV 62	XVI 63	XVII 65	XVIII 63
XXII 85	XXIII 87	XXIV 88	XXV 80	XXVI 87	XXVII 82	XXVIII 82	XXIX 87	XXX 83	XXXI 90	XXXII 97	XXXIII 98
XXV 22	XXVI 23	XXVII 27	XXVIII 20	XXIX 23	XXX 28	XXXI 26	XXXII 23	XXXIII 20	XXXIV 22	XXXV 23	XXXVI 28
XXV 82	XXVI 84	XXVII 79	XXVIII 84	XXIX 79	XXX 79	XXXI 80	XXXII 75	XXXIII 75	XXXIV 77	XXXV 75	XXXVI 74
XXI 116	XXII 107	XXIII 112	XXIV 112	XXV 115	XXVI 106	XXVII 116	XXVIII 108	XXIX 102	XXX 101	XXXI 119	XXXII 121
XXVI 80	XXVII 98	XXVIII 98	XXIX 103	XXX 103	XXXI 98	XXXII 101	XXXIII 100	XXXIV 101	XXXV 107	XXXVI 101	XXXVII 102
XXIV 33	XXV 30	XXVI 29	XXVII 32	XXVIII 34	XXIX 31	XXX 34	XXXI 30	XXXII 31	XXXIII 32	XXXIV 33	XXXV 36
XVII 36	XVIII 30	XIX 32	XX 31	XXI 33	XXII 33	XXIII 32	XXIV 31	XXV 31	XXVI 32	XXVII 31	XXVIII 34
VII 35	VIII 36	IX 36	X 36	XI 35	XII 35	XIII 36	XIV 38	XV 35	XVI 36	XVII 33	XVIII 34
XXIV 109	XXV 104	XXVI 106	XXVII 107	XXVIII 104	XXIX 99	XXX 101	XXXI 103	XXXII 101	XXXIII 103	XXXIV 108	XXXV 104
XVIII 62	XIX 62	XX 63	XXI 62	XXII 62	XXIII 62	XXIV 65	XXV 61	XXVI 59	XXVII 63	XXVIII 60	XXIX 64
XVI 48	XVII 44	XVIII 48	XIX 47	XX 46	XXI 43	XXII 41	XXIII 44	XXIV 46	XXV 47	XXVI 46	XXVII 46
VII 75	VIII 77	IX 73	X 76	XI 83	XII 80	XIII 78	XIV 78	XV 81	XVI 85	XVII 79	XVIII 80
XI 90	XII 84	XIII 84	XIV 80	XV 94	XVI 82	XVII 84	XVIII 83	XIX 86	XX 84	XXI 88	XXII 84
XII 21	XIII 27	XIV 26	XV 28	XVI 26	XVII 26	XVIII 25	XIX 30	XX 26	XXI 27	XXII 27	XXIII 26
VII 47	VIII 49	IX 46	X 48,	XI 49	XII 50	XIII 50	XIV 46	XV 46	XVI 46	XVII 47	XVIII 44
VII 75	VIII 81	IX 80	X 78	XI 70	XII 70	XIII 70	XIV 70	XV 70	XVI 68	XVII 67	XVIII 68
VII 100	VIII 100	IX 104	X 101	XI 101	XII 100	XIII 98	XIV 100	XV 103	XVI 104	XVII 104	XVIII 99

SERIES.

Name of felling series.	Anticipated yield per acre. Fuel. TONS.	Small timber. C.FT.		Area of coupes—Coupe number—cont. (23)	(24)	(25)	(26)	(27)	(28)
									(a) REGULAR
Vellore Range—cont.									
1 Komiar	8	1	C. No.	XXXVI	XXXVII	XXXVIII	XXXIX	..	..
			Area.	84	85	87	85	..	..
2 Usoor	6	..	C. No.	XXXVI	XXXVII	XXXVIII	XXXIX	..	..
			Area.	56	62	60	62	..	..
3 Vellakal	2	..	C. No.	XXXVII	XXXVIII	XXXIX	XL	..	..
			Area.	48	47	47	50	..	..
4 Thellai	8	..	C. No.	XXXVII	XXXVIII	XXXIX	XL	..	..
			Area.	77	80	83	81	..	..
5 Karungalthody	6	4	C. No.	XXXVIII	XXXIX	XL	XLI	..	..
			Area.	62	66	66	62	..	..
6 Tiruvallam (Plantation East)	Particulars given separately.								
7 Virinchipuram (Plantation West)	Particulars given separately.								
Odugathur Range—cont.									
1 Vinnamagalam	4	..	C. No.	XXVI	XXVII	XXVIII	XXIX	XXX	XXXI
			Area.	29	27	25	25	28	33
2 Ambur	5	12	C. No.	XXXV	XXXVI	XXXVII	XXXVIII	..	..
			Area.	98	110	112	108	..	..
3 Naickaneri	5	12	C. No.	XXXVI	XXXVII	XXXVIII	XXXIX	..	..
			Area.	111	107	98	109		..
4 Panangatteri North	5	1	C. No.	XXXV	XXXVI	XXXVII	XXXVIII	..	..
			Area.	85	90	89	88	..	..
5 Panangatteri South	8	1	C. No.	XXIX	XXX	XXXI	XXXII	XXXIII	XXXIV
			Area.	27	39	34	36	37	36
6 Munukkal	5	..	C. No.	XXXI	XXXII	XXXIII	XXXIV	XXXV	XXXVI
			Area.	20	21	24	26	26	26
7 Kallaparai	8	6	C. No.	XXX	XXXI	XXXII	XXXIII	XXXIV	XXXV
			Area.	47	51	50	50	50	50
8 Kuppampalayam	4	1	C. No.	XXXIV	XXXV	XXXVI	XXXVII	..	..
			Area.	45	45	41	46	..	..
9 Pallipattu	4	3	C No.	XXXIV	XXXV	XXXVI	XXXVII	..	..
			Area.	46	46	46	30	..	..
10 Asnampet	4	1	C. No.	XXXVII	XXXVIII	XXXIX	XL	..	..
			Area.	81	76	72	83	..	..
11 Karuthamalai	6	..	C. No.	XXI	XXII	XXIII	XXIV	XXV	XXVI
			Area.	60	62	63	58	58	58
12 Tattankinar North	6	..	C. No.	XXI	XXII	XXIII	XXIV	XXV	XXVI
			Area.	40	46	44	42	41	42
13 Tattankinar South	6	..	C. No.	XIX	XX	XXI	XXII	XXIII	XXIV
			Area.	60	62	62	64	60	60
14 Tattankinar East	5	..	C. No.	XXXIV	XXXV	XXXVI	XXXVII	..	..
			Area.	93	90	101	104	..	..
Santhavasal Range—cont.									
1 Amerdi	6	..	C. No.	XXXVII	XXXVIII	XXXIX	XL	..	..
			Area.	25	26	2s	26	..	..
2 Santhavasal	5	..	C. No.	XXXVII	XXXVIII	XXXIX	XL	..	..
			Area.	73	71	68	62	..	
3 Karnatagiri	2	..	C. No.	XXXIII	XXXIV	XXXV	XXXVI	..	..
			Area.	108	90	77	85	..	..
4 Malayalam	..	..	Rest.						
Polur Range—cont.									
1 Thaniyar	6	5	C. No.	XXXVIII	XXXIX	XL	XLI	..	..
			Area.	106	109	103	104	..	..
2 Pullumedu	5	4	C. No.	XXXVI	XXXVII	XXXVIII	XXXIX	XL	..
			Area.	31	36	29	28	28	..
3 Jambumalai	6	3	C. No.	XXIX	XXX	XXXI	XXXII	XXXIII	XXXIV
			Area.	33	30	30	36	34	37
4 Arasampet	6	..	C. No.	XIX	XX	XXI	XXII	XXIII	XXIV
			Area.	32	32	37	34	26	33
Tiruvannamalai Range—cont.									
1 Ponniar East	5	..	C. No.	XXXVI	XXXVII	XXXVIII	XXXIX	..	..
			Area.	105	106	104	106	..	..
2 Ponniar West	5	..	C. No.	XXX	XXXI	XXXII	XXXIII	XXXIV	XXXV
			Area.	63	62	62	63	63	66
3 Veppur East	5	..	C. No.	XXVIII	XXIX	XXX	XXXI	XXXII	XXXIII
			Area.	44	46	46	47	48	49
4 Veppur West	5	..	C. No.	XIX	XX	XXI	XXII	XXIII	XXIV
			Area.	82	79	78	77	84	81
5 Reddipalayam	5	..	C. No.	XXIII	XXIV	XXV	XXVI	XXVII	XXVIII
			Area.	89	80	84	90	90	88
6 Rayandapuram	6	..	C. No.	XXIV	XXV	XXVI	XXVII	XXVIII	XXIX
			Area.	28	29	25	28	28	26
7 Perunkolathur Swamimalai	5	..	C. No.	XIX	XX	XXI	XXII	XXIII	XXIV
			Area.	51	47	46	48	48	45
8 Bheemarapatty	10	..	C. No.	XIX	XX	XXI	XXII	XXIII	XXIV
			Area.	69	69	69	67	69	73
9 Pavunjipattu	6	..	C. No.	XIX	XX	XXI	XXII	XXIII	XXIV
			Area.	101	102	100	100	99	97
									(b) RESERVE
Polur Range—cont.									
1 Komattiyur	Coupes not allocated.								
2 Patrakad	Coupes not allocated.								

Area of coupes—Coupe number—*cont.*

(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)
SERIES—*cont.*										
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
XXXII 32	XXXIII 32	XXXIV 36	XXXV 39	XXXVI 27	XXXVII 30	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
XXXV 36	XXXVI 39	XXXVII 37	XXXVIII 33	..	..	..	..	..	..	..
XXXVII 23	XXXVIII 27	XXXIX 27	XL 25	XLI 25	..	..	..	..	..	..
XXXVI 49	XXXVII 49	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
XXVII 63	XXVIII 56	XXIX 64	XXX 62	XXXI 54	XXXII 62	XXXIII 61	XXXIV 62	XXXV 64	..	..
XXVII 35	XXVIII 35	XXIX 40	XXX 39	XXXI 40	XXXII 39	XXXIII 36	XXXIV 40	XXXV 36	..	..
XXV 61	XXVI 62	XXVII 63	XXVIII 60	XXIX 60	XXX 60	XXXI 62	XXXII 60	XXXIII 60	XXXIV 60	XXXV 60
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..
XXXV 33	XXXVI 33	XXXVII 38	..	..	..	..	..	..	..	..
XXV 38	XXVI 32	XXVII 35	XXVIII 36	XXIX 38	XXX 38	XXXI 36	XXXII 34	XXXIII 26	XXXIV 25	XXXV 30
..	..	..	..	..	..	..	..	..	..	..
XXXVI 63	XXXVII 60	XXXVIII 38	..	..	..	..	..	..	..	..
XXXIV 51	XXXV 56	XXXVI 56	XXXVII 60	..	..	..	..	..	..	..
XXV 73	XXVI 81	XXVII 77	XXVIII 86	XXIX 80	XXX 83	XXXI 83	XXXII 78	XXXIII 83	XXXIV 85	XXXV 79
XXIX 76	XXX 78	XXXI 72	XXXII 80	..	..	..	..	..	..	..
XXX 24	XXXI 24	XXXII 25	XXXIII 23	XXXIV 21	XXXV 22	XXXVI 25	..	..	..	..
XXV 48	XXVI 46	XXVII 44	XXVIII 50	XXIX 50	XXX 51	XXXI 50	XXXII 51	XXXIII 49	XXXIV 58	XXXV 56
XXV 73	XXVI 74	XXVII 71	XXVIII 67	XXIX 71	XXX 73	XXXI 73	XXXII 71	XXXIII 69	XXXIV 69	XXXV 71
XXV 99	XXVI 100	XXVII 97	XXVIII 99	XXIX 100	XXX 99	XXXI 104	XXXII 104	XXXIII 105	XXXIV 104	XXXV 105
SERIES—*cont.*										

SECTION 3—METHOD OF EXECUTING THE FELLINGS.

298. *Regulation of operations.*—The working will be regulated on the basis of equal areas, the average area of the annual coupe being the balance area of the felling series divided by the balance number of years in the rotation fixed.

299. *Method of executing the fellings.*—One coupe in each of the felling series will normally be felled every year. The sequence of coupe is indicated in the fuel working map not only up to the period of the plan but to the end of the rotation. The coupes, however, have not been definitely allotted to year. This does not mean that the sequence indicated in the fuel working map is to be deviated from. On the other hand it should, as far as possible, be adhered to. Incompletely felled coupes may be worked with the coupe of the succeeding year. If a coupe is not worked in a year, it may be worked in the next year together with the coupe of that year but the fact must be noted in the control book. Arrears should also be noted in the control book giving full reasons.

If a coupe in any series cannot be worked for any reason during any year, no deviation from the working plan is involved. The fact, with full reasons should, however, be recorded in the control book.

300. *Laying out and demarcation of coupes.*—The coupes to be sold in the regular felling series will be surveyed and demarcated by means of cut lines 6 feet wide by the end of November of the year preceding that of felling. Where a boundary corresponds to a reserve line, stream, road or other well defined feature, such cut line is not necessary. If, when laying out a coupe it is found that any stream, footpath, etc., which has been adopted as a boundary, does not actually exist or is in a different position to that shown on the map owing to inaccuracies in survey, a straight line must be cut to join the points in question, the main considerations being—

(i) to adhere to the prescribed area as far as possible;

(ii) to keep the cost of demarcation down to the minimum.

Economy in laying coupes is enjoined. An intelligent use wherever possible to take advantage of an existing stream or other natural boundary should be made rather than a slabish adherence to the lines given on the map. Petty differences between the prescribed and actually surveyed areas need not require sanction for deviations, provided the total accumulated difference in area is not more than 10 per cent of the total area of the coupe.

301. *Cost of demarcation.*—It has been customary in the past to hand over all fuel resulting from the clearing of coupe lines to the contractors, who purchase the respective coupes and, at the same time, to recover from them the cost of clearing. A condition to this effect is embodied in the sale notice each year. The practice has worked satisfactorily in the past and should continue.

302. *Agency of felling.*—Felling will invariably be carried out through the agency of contractors and coupes sold in public auction every year in sufficient time to permit of purchasers beginning felling on, or as soon as possible after, the 1st of April. Where there is a demand for green leaves for manure, coupes will be sold in public auction in the month of June prior to the year of working.

303. *Period of lease.*—Leases will begin on the 1st of August each year and will be current for six months (until 31st January of the following year) for the removal of green leaf and eleven and twelve months respectively from the 1st of April for felling and removals. Terminating felling one month ahead of removals affords an opportunity of getting defects remedied by contractors before their security deposits are returned and also eliminates, to a large extent, the necessity for departmental rectification and the consequent adjustments of petty items of expenditure. In the case of coupes left unsold in the general sale but sold subsequently, it will also be arranged that the lease terminates on the last day of February with reference to felling and on the 31st of March for removals.

304. *Coupe arrears.*—If any portion of a coupe remains unfelled on the 31st March, it will be surveyed and the area computed sold in open auction.

305. *Division of coupes into strips and control of fellings.*—Immediately a coupe is sold it will be divided into a convenient number of strips either by natural features or cleared lines 6 feet wide, so that the area of each strip is from 20 to 25 acres. In coupes situated on slopes the strip lines should invariably run across the contours. The coupes will be felled strip by strip. Work in each strip must be completed and passed as satisfactory by the Range Officer before work may begin in the next strip.

306. *Green leaf manure.*—Advance removal of green leaf manure from fuel coupes has been dealt with in paragraphs 302 and 303 in accordance with G.O. Ms. No. 1573, Development, dated the 14th July 1937.

307. *Cutting thorny growth at the time of felling.*—In many parts of the working circle, the forest is composed largely of thorny growth. Natural regeneration of fuel species is almost absent. Thus, the question of uncut growth suppressing natural regeneration or coppice regrowth need not be considered. Cutting throny growth throughout would unnecessarily expose the soil in many places at a time of the year, when cover is most needed. Silviculturally, therefore, no useful object is achieved by insisting on the contractor cutting more than he wishes to cut as saleable. Further Mr. A. R. Brand, who conducted an experiment, has found that cut thorns reproduce prolifically by numerous coppice shoots. Therefore, the contractor need not cut.

308. *Useless tree species.*—Here again the question of soil cover is the chief consideration. In the absence of natural regeneration, there is no point in felling useless tree species, such as *Dalbergia paniculata* and *Gyrocarpus jacquini*.

309. *Felling rules.*—With the following exceptions, all trees shall be felled flush with the ground, leaving the bark intact adhering to the wood all round :—

Exceptions.—Sandal, sound tamarind, wood-apple and other minor forest produce-yielding trees. Bark-yielding species, such as *Cassia auriculata* and *fistula*.

(i) The trees not to be felled will be marked by Range Officers before the sale and a list prepared and produced at the sale for the information of bidders.

(ii) Stools need not be coppiced.

(iii) The cut must be as low as possible and on no account should the stools be more than 6 inches high.

(iv) Thorny growth and useless unsaleable trees need not be cut.

(v) All fellings in the coupe shall be done only by the coolies of the contractor and the contractor or his authorized agent shall be present during the fellings.

310. *Disposal of felled material*—(i) *Small timber.*—All small timber shall be hammer marked by the beat forest guard before it is removed from the coupe.

(ii) *Firewood.*—All felled firewood, down to whatever size the contractor chooses to remove, shall be billetted and stacked prior to removal. The size of the stacks will be fixed by the District Forest Officer in consultation with the contractor. A uniform size should be adopted throughout the division.

(iii) *Twigs and thorns.*—The cutting and removal of twigs and thorns by purchasers and consumers, under headload chits issued by the contractor, shall not be permitted as, obviously, the contractor, or his agent, will sell chits in the town, or on the roadside, even though he may be bound by agreement to sell them in the coupe. Purchasers then, armed with a chit to safeguard them, collect their headloads by pilfering from the nearest point of the reserve.

SECTION 4—TABULAR STATEMENT OF FELLINGS.

311. As definite coupes have not been allotted to definite years of working, no tabular statement of fellings is necessary. The areas of all the coupes in each felling series have been furnished in the statement at paragraph 297.

SECTION 5—SUBSIDIARY SILVICULTURAL REGULATIONS.

312. *Artificial regeneration*—(1) *Palar plantations.*—The five Palar river plantations with their accretions will be regenerated with fast growing species, such as *Inga dulce* and *Prosopis juliflora* which seem to suit the soil. The existing casuarina plantations will be clear-felled at the end of the rotation and regenerated with the abovementioned species.

The statement below gives the years of felling and regeneration :—

Name of felling series.	*Locality.*	*Year of felling.*	*Coupe number.*	*Area.* ACS.	*Year in which to be regenerated.*
Tiruvallam series ..	Tiruvallam	1952–53	I	66	1953–54.
	Do.	1953–54	II	130	1954–55.
	Vannivedu	1954–55	III	57 }	1955–56.
	Tiruvallam	1954–55	IV	152 }	
	Kilminnal	1955–56	V	51 }	1956–57.
	Tiruvallam	1955–56	VI	132 }	
	Kilminnal	1956–57	VII	56 }	1957–58.
	Vannivedu accretions ..	1956–57	VIII	17 }	
	Tiruvallam accretions ..	1957–58	IX	4-2/3	1958–59.
Virinchipuram	Virinchipuram	1952–53	I	17	1953–54.
	Do.	1953–54	II	44	1954–55.
	Do.	1954–55	III	117	1955–56.
	Do.	1955–56	IV	75 }	1956–57.
	Ammundi	1955–56	V	83 }	
	Virinchipuram (accretions).	1956–57	VI	24 }	1957–58.
	Ammundi	1956–57	VII	80 }	
	Ammundi (accretions) ..	1957–58	VIII	58½	1958–59.

The felled areas will be regenerated in the following year in which it is felled.

313. *Method of treatment—Silvicultural system.*—The system will be clear-felling and regenerating with *Prosopis juliflora* and *Pithecolobium dulce*. The area will be sold in aution and the period of lease, the execution of fellings and other regulations will be the same as laid down for the other fuel felling series. The casuarina stumps may be allowed to be uprooted at the discretion of the District Forest Officer.

314. *Rotation.*—No rotation is fixed as these areas will not be mature for felling during the currency of the working plan. This can be fixed in the next revision, judging the rate of growth of the species.

315. *Preparation of the ground.*—After the area has been handed over by the contractor, all regrowth thorny bushes and climbers, if any, should be cut back and spread over the area and burnt in May and June after the cut " lop and top " gets dry.

316. *Mode of regeneration*—(i) *Species to be used—Inga dulce, **Prosopis juliflora.***

(ii) *Method—Prosopis juliflora.*—By planting nursery seedlings raised in pots open at both ends and roughly of the following size : height of post 5 inches, diameter at the top end 4 inches, diameter at the bottom end 3 inches. Such pot plants will be put out early with the south-west monsoon, after one or two showers have fallen. The pots will be cracked before lowering it in pits one foot cube each with the two halves of the pot removed about six weeks after the planting, when the plants have established themselves and have thrown out new flush of leaves.

(iii) *Espacement.*—The espacement will be 12 feet by 12 feet. The species used will alternate in single rows.

(iv) *Nursery.*—The site for the nursery selected should be as near to the area to be planted as possible and in sandy soil. It will be effectively fenced and watered until the plants are sufficiently big, i.e., not less than 12 inches and not more than 24 inches of the shoot system. The site must be sheltered from wind, and should not have overhead tree shade. No reasonable expense should be spared in making a thorough success of the nursery which is the foundation of the successful plantation work.

(v) *Planting.*—The area will be marked by marking scoops by means of a mamuti at 12 feet by 12 feet. Planting will be done with the south-west monsoon after one or two rains have fallen. Pitting will be done simultaneously with planting, the pits being of sufficient size to accommodate the roots without distortion.

317. *Inga dulce.*—Seeds will be sown direct in prepared soil. Two to three seeds should be sown and should be covered with a thin layer of soil. Sowings will be done with the south-west monsoon after one or two rains have fallen.

318. *Concentrated ' Kumri ' regeneration—Introduction.*—In the last plan, ' rab ' regeneration was prescribed to be done, in the felled fuel coupes. This was followed for some years but was finally given up as per C.C.P. No. 31/41, dated 17th January 1941. From 1940–41 to 1942–43, ' Kumri ' regeneration was undertaken in the felled coupes both by kumridars as well as by the department. In the year 1944, Mr. Mitchell, District Forest Officer, Vellore East, drew up a scheme which was approved by Salem Circle Conservator in his No. 1145/43L., dated 28th April 1944. He selected areas containing soils suitable for ' Kumri ' regeneration. He expected that kumridars would be forthcoming but unfortunately except in Santavasal and Vellore ranges no kumridars came forward and the work had to be done departmentally. Experience shows that departmental ' Kumries ' have failed. Hence it is own proposed that ' Kumri ' should be undertaken only if kumridars are forthcoming willingly and subject to favourable terms taking care to provide safeguards agianst any possible claims for eventual assignment of the land on patta.

319. *Object.*—(i) The principal objects of management will be to make the selected and most fertile areas produce a great deal more of fuel and small timber than they do at present, with a view to eliminate from fuel working, in the next rotation, steep hill slopes and other essentially protective forests, which have hitherto been included in order to meet the demand for fuel. Therefore the greater the stand that can be raised in the non-productive forests, the larger the area of unsuitable forests that can be excluded from working in the next rotation.

(ii) To introduce good species in these potential areas of poor growth at present and thus improve the forests.

(iii) To introduce these species in such a way that they will be distributed over the largest area possible so that they will spread naturally over as large an area as possible.

320. *Area kumried and extent of area available.*—Suitable areas that have been selected forc oncentrated 'Kumri' regeneration have been shown in a separate map, with details of areas already kumried. The areas selected have not been surveyed but just sketched in by eye. Details of suitable areas available in the four ranges are as under :—

Range.	*Reserved forest.*	*Name of fuel felling series in which area is situated.*	*Total area.*	*Area kumried.*	*Area available.*
			ACS.	ACS.	ACS.
Odagathur	Ambur fuel	Vinnamangalam	59	..	59
Do.	Ambur	Kuppampalayam and Pallipattu.	655	90	565
Do.	Karuthamalai	Asanampattu	250	..	250
Do.	Do.	Karuthamalai	230	..	230
Vellore	Arasampet	Komiar	205	141	64
Do.	Do.	Vellakkal	120	..	120
Do.	Athiyur	Usoor	70	..	70
Santavasal	Santavasal	Santavasal	242	151	91
Tiruvannamalai	Pavunjipattu	Pavunjipattu	180	..	180*

* The 180 acres available for concentrated 'Kumri' regeneration should be taken only after the fuel coupes falling within the area are felled.

321. *Method of regeneration.*—The first consideration is to regenerate these areas with good species economically and in order to do this, it is essential that the concentrated regeneration should be combined with 'Kumri', i.e., in conjuction with the cultivation of field crops. If kumridars are not forthcoming, the work should not be undertaken.

322. *Allocation of areas amongst kumridars.*—Selection of kumridars is an important factor on which the success of 'Kumri' cultivation will depend. Past experience has shown that kumridars are forthcoming only in Vellore and Santhavasal ranges.

The extent of land that should be allotted to a kumridar shall not exceed 5 acres at a time. Within this maximum limit, the allocation of areas each time must be made with reference to the capacity and earnestness of the individual kumridar, whose circumstances must be carefully investigated by the District Forest Officer before adjudging his merits for the grant of the land. The total area that may be given for regeneration to the several kumridars shall be limited to 30 acres at a time in each range. This limitation is considered necessary from the view point of supervision of 'Kumri' work by the executive staff. The area given to the different kumridars at a time shall, as far as possible, be confined to one campact locality.

323. *Issue of permits under section 21 of the Madras Forest Act.*—The District Forest Officer shall issue to each of the selected kumridar a permit under section 21 of the Madras Forest Act in respect of the forest land allotted to him for 'Kumri' cultivation. The permit will be renewed, annually, for five years. At the expiry of five years, the area will revert to the Forest department.

324. The permit under section 21 shall contain suitable condition, which should aim at safeguarding the interest of the Forest department in regard to the successful regeneration of the area concerned and in all other aspects such as protection of the adjoining forests from theft of forest produce, from illicit grazing, from fire, etc. As the success of 'Kumri' method of regeneration will depend on the willing co-operation of the kumridars, care should be taken not to include any condition in the permit, which will cause undue hardship to the kumridars.

325. *General details of the method*—(i) *Initial work, burn, etc.*—The area to be leased to each individual kumridar should be fixed by the District Forest Officer with reference to the kumridar's capacity. It should be surveyed beforehand and a sketch of the land shall be attached to the permit issued under section 21. The area to be kumried should be handed over to the kumridars in December each year, who, then cut the standing growth and spread it evenly along with other slash. The burning should be done in the evening against the breeze and early in the year before the hazardous fire season is at its height (April). The kumridar shall then plough or otherwise prepare the soil for growing field crops. Where, on account of stumps no ploughing is possible, the soil may be prepared with hoes or other implements in such manner as is common in the locality.

326. *Soil-working and lay-out.*—This should be undertaken towards the end of April. Soil-working should be at least 3 inches deep. Strips of worked up soil 4 feet broad shall be demarcated an espacement of 30 feet from centre to centre (26 feet from edge to edge) for the reception of the seeds of the tree species. In the strips, the soil should be dug up to a depth of at least 6 inches and all stones, etc., removed and the clods of earth broken up. A vantage should be taken of the thunder showers in April-May, which will facilitate and cheapen the work. The strips will run approximately along the contours on slopes but along the shorter edge of the area on the level. Every strip will be staked at either end and given a number.

327. *Bunding.*—Simultaneously with the soil preparation, protection against wash of the thunder showers in April-May should be taken up. This is done by bunding small slopes, depressions, gullies, etc., with stone bunds. Where stones are not plentiful, pieces of stems of useless trees left on the area, or small branches pegged down will do just as well. On gentle slopes earth bunds will prove effective. Bunding is very useful in not only preventing the wash of soil and light seed, but also holds up the rain water and allows it to percolate into the soil and thus conserves moisture. These bunds in the first year must be watched, repaired and extended, if necessary, to prevent young seedlings from being washed away.

328. *Seed collection.*—The seed necessary in each range will be collected by the subordinates free of cost. Only fresh and fertile seed should be used each year.

329. *Sowing.*—Sowing should be done well in advance of the south-west monsoon, i.e., June-July.

The kumridars will look after the tree seedlings and keep them clean weeded and soil worked until they vacate the area.

The kumridar will supply labour at his own cost for all the works mentioned. The work will be carried out only under the supervision of forest subordinates.

330. *Field crops.*—Any field crop may be raised except Cholam (*Andropogon sorghum*) and Cumbu (*Pennisetun thyphoideun*), pumpkins, cucumbers and castor.

The following are usually the crops favoured :—

(1) Ragi (*Elensine coracana*) ; (2) Tenai (*Setaria italica*), Samai (*Pennisetum miliare*), Varagu (*Paspalun scrobilatum*) and brinjal and chillies.

It is suggested that the introduction of good species of fodder grass after the last crop of the cultivation deserves consideration. If this is successful, it will improve the grazing qualities of the area as well as ensuring an improvement in the tree growth.

331. *Forest crops.*—A list of species suitable for 'kumri' regeneration is given below, with notes on collection of seed, seed weight and the kind of soils suited to each species. Other species may be tried in consultation with the Provincial Silviculturist and with the sanction of the Conservator of Forests.

Forest species considered suitable for 'kumri' sowings.

Species. (1)	*Time of collection of seeds.* (2)	*Approximate number of seeds per ounce.* (3)	*Remarks.* (4)
1 *Acacia planifrons* ..	July to September ..	600	Suitable for all soils but particularly good for poor and stony soils.
2 *Acacia ferruginea* ..	March and April ..	157	A fast grower and suitable for good and medium soils.
3 *Acacia leucophlaea* ..	April to June ..	1,300	All soils but specially on stiff clayey loam.
4 *Acacia latronum* ..	February and March	..	Specially suited for poor stony soils.
5 *Acacia sundra*	March and April ..	..	Do.
6 *Alibizzia lebbek*	March to May ..	200	A fast grower and useful as timber. Specially suited for good loamy soils along stream banks.
7 *Albizzia amara* ..	January to March ..	400	Good fuel and small timber. Suitable for even poor soils.
8 *Albizzia odoratissima* ..	February to April ..	..	Same as Albizzia lebbek.
9 *Chloroxylon swietenia* ..	May to August ..	3,200	Use fresh seed collected from trees, Useful as timber.
10 *Cassia siamea*	March-April ..	1,085	A fast grower. Second rate of fuel. Leaves largely used for green manure.
11 *Cleistanthus collineus* ..	July and August ..	..	Small timber value.
12 *Canthium didymum* ..	....	..	A good fuel and grows under all conditions where the soil is not too poor.
13 *Dolichandrone crispa and falcata.*	....	..	Suitable for poor soils.
14 *Melia indica or Azadirachta indica.*	June to August ..	..	Sow fresh seed collected from under the the trees ejected by birds.
15 *Ingadulcis or Pathocolobium dulce.*	April to May ..	..	Good fuel. Particularly suited to sandy soils.
16 *Prosopis spicigera* ..	June to August ..	740	Well suited for dry localities.
17 *Pongamia glabra* ..	June-July	..	Moist situation along stream banks.
18 *Sapindus emarginatus* ..	March	25	....
19 *Tamarindus indica* ..	March to May ..	..	A slow grower. A good fuel and charcoal wood.
20 *Wrightia tinctoria* ..	August-September	..	....
21 *Zizyphus jujuba* ..	December to March ..	..	Good fuel and wood used, for agricultural implements.

Several species should be sown in each line, as soil conditions vary considerably even in the same area and our knowledge as to what exactly is most suitable is at present very limited. The seeds of browsable species should be sown intermixed with the seeds of thorny species to protect the former from browsers.

332. *Soil working.*—Soil working is important, and should be done thrice in the first growing season as follows :—

(1) The first soil working should be done one month after germination when the seedlings are 3 to 4 inches high. The soil should be worked to a depth of 1 to 2 inches and about 3 inches away from the seedlings so as not to disturb the roots.

(2) The second soil working should be done by the end of the north-east monsoon and the soil working must be 6 inches deep and 6 inches away from the plants.

(3) The third soil working should be done, about the end of January a foot away from and on either side of the seedling lines and should be 6 to 9 inches deep. The final soil working, if done, properly and at the correct time, lasts right through the hot weather and enables the backward plants to get through.

333. *Later tending.*—The aim should be that the forest crop is completely established by the end of the first or at least by end of the second year.

Blanks may be dibbled in the second year when the field crop is sown again. Weeding will be done by the kumridars.

334. Before the kumridar vacates the area, a soil working should be done, and in between the tree lines spear grass will be sown, the seeds to be supplied by the department.

SECTION 6—OTHER REGULATIONS.

335. *Supply of small timber to ryots for the manufacture of agricultural implements.*—The contractor shall be required to supply, on demand by the ryots, small timber for the manufacture of agricultural implements in as far as it is available in his coupe. A clause to this effect should be inserted in the agreement.

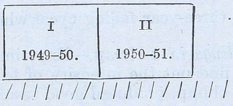
336. *Disposal of palmyra palms.*—The palmyra palms occurring in the two Palar plantations and elsewhere in the division, which are inferior in quality, may be removed as fuel if they fall within the fuel series. If not these trees can be sold standing by the District Forest Officer, after fixing the seniorage and getting the previous sanction of the Conservator, for bona fide domestic or agricultural purposes. On no account these should be sold on a commercial basis.

337. *Indicator areas.*—The felling of indicator areas is not prescribed. The anticipated yield per acre from the various felling series, furnished in columns (2) and (3) of the statement in paragraph 297 are based on the actual outturns of ten years working, and obviously these anticipated yields are likely to be more accurate than any estimate framed by felling a plot or strip one acre in extent in forest the constitution of which varies from acre to acre.

338. *Closure to grazing.*—Felled coupes will be closed to grazing for four years including the year of felling, but grass cutting in particular areas may be permitted with the specific sanction of the Conservator. Closed coupes when thrown open for grazing must be done on a rotational basis. The closed coupes will be indicated by a red band three inches broad painted across the coupe stones.

339. Rights of way and other specially made paths passing through closed areas to legitimate grazing grounds or watering places will be fenced on either side by the department, provided there are no suitable alternative paths.

340. *Coupe stones.*—As soon as possible after the completion of felling in a coupe, four stone slabs three or four inches in thickness and of the usual size will be planted, one at each corner. If a coupe has more than four sides, it is sufficient if stones are planted at the four salient corners. The number of the coupe and the year of felling will be engraved on each stone. On a common boundary between two coupes a double stone, as illustrated below, will be planted.



CHAPTER IV—WORKING PLAN FOR THE BAMBOO WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AREA AND CHARACTER OF THE VEGETATION.

341. *General constitution and area.*—The Bamboo Working Circle is 189,770 acres in extent and includes all areas in the division where bamboos are found in workable quantities. As bamboos are extracted from steep slopes and carried to forest depots in head loads the

question of excluding any areas from the working circle on the ground of inaccessibility does not arise. Even though the remotest areas are being exploited, the nearly areas especially those around the hill villages are being over exploited.

342. The working circle is distributed in the various ranges as follows :—

	ACS.
Odugathur Range	52,416
Vellore Range	32,672
Santavasal Range	46,316
Polur Range	46,881
Tiruvannamalai Range	11,485
	189,770

343. *Character of the vegetation.*—A brief description of the bamboo forest has been given in paragraphs 45 to 48.

344. *Flowering and dying of bamboos.*—Dates of flowering in the past have been given in paragraph 49. As a result of gregarious flowering of bamboo, there is now prolific natural regeneration.

345. *Damages to bamboo.*—Extensive damage by lopping and over-grazing has been done to young regeneration of bamboos. The damage is met with practically throughout the working circle and is particularly striking around the enclosures. The few *Dendrocalamus strictus* clumps that did not flower have been repeatedly hacked at a height of 8 to 10 feet from the ground and where such repeated hacking has taken place the clumps are either dead or very nearly so. Prescriptions dealing with this are given in section 5 below.

SECTION 2—METHOD OF TREATMENT.

346. *General.*—Bamboo fellings are made over vast areas every year. Under existing conditions departmental working is out of the question. Bamboo coupes shall therefore be worked only through the agency of contractors. As long as the exploitation is carried out through the agency of contractors, it is extremely difficult for the staff to enforce precise and elaborate prescriptions, however, desirable they may be silviculturally. It is, therefore, essential that felling rules should be such that they are easily understood by the cutting coolie and their infringement readily apparent to inspecting officers. The most important points to be considered in framing felling rules are—

(i) The felling cycle.

(ii) The intensity of fellings in the clump.

(iii) The height at which culms should be cut.

(iv) Removal of 'picottah' bamboos.

In general there is more demand for *Dendrocalamus strictus* than *Bambusa arundinacea*. The latter is not lopped for cattle fodder and it reproduces itself much more prolifically, than *Dendrocalamus strictus* and withstands unrestricted and irregular cutting. In fact, except after flowering and seeding it is very rare to see a dead *Bambusa arundinacea* clump. As such there is no likelihood of *Bambusa arundinacea* being overworked to such an extent as to cause any appreciable deterioration of the crop as a whole. However, as both the species occur as a mixed crop often extensively, the rules framed for *Dendrocalamus strictus* will be followed for both *Dendrocalamus strictus* and *Bambusa arundinacea*.

347. *Felling cycle.*—The three-year felling cycle which is in vogue will be continued.

348. *The intensity of fellings in a clump.*—Experiments conducted in the past (vide paragraph 177 of Part I) to find out the intensity of felling in a clump, showed that the retention of four culms per clump, produced good results. Hence a minimum of four culms per clump excluding those of the current year, is prescribed.

349. *The height at which culms should be felled.*—This question is one on which there is considerable difference of opinion. There is no truth in the belief that felled culms die back at the rate of one internode a year, but it is perhaps probable that felling a few feet from the ground preserves the rhizomes below for a longer period than low felling does. In practice the most convenient height is from two to three feet from the ground and, silviculturally, there seems to be no objection to this.

350. *Felling rules.*—In the light of what has been said above, the following felling are prescribed :—

(i) No current year's culms shall be felled. When young culms are absolutely necessary for basket making or similar purposes, the District Forest Officer will confine removals to definite areas, the location and size of which will depend on the nature of the demand. Such areas should be as limited as possible.

(ii) A minimum of four mature culms, that is, culms over a year old, shall be left in each clump.

(iii) Felling shall be done at a height of from two or three feet from the ground.

(iv) As the bamboos have gregariously flowered and died, the removal of 'picottah' bamboos (mature straight culms of *Dendrocalamus strictus* with rhizomes in tact) will not ordinarily be permitted. However, it is left to the District Forest Officer to grant permission for such removals, if he justifies himself that the application is bona fide, subject to the condition that the removals should be confined to an area of 100 acres in the coupe of the year in one felling series of each range.

351. *Calculation of the yield.*—The quantity of bamboos (in culms) exploited during the period of the last working plan was collected from the control journal records and is given in the statement of yield of bamboos in Chapter V of Part I. It is not possible to forecast the yield of bamboos with any degree of accuracy as bamboos have flowered gregariously and there is prolific natural regeneration consequently.

SECTION 3—METHOD OF EXECUTING THE FELLINGS.

352. *Subdivision of the area.*—The existing felling series and coupes will be retained in view of the fact that in drawing up the working plans in which they were prescribed (vide paragraphs 170 and 171) very careful consideration was given to the Malayalee labour supply, the use of collection depots and extraction paths. The details relating to each felling series are set forth in the statement below. The District Forest Officer may change the collection depots and extraction paths for any coupe from time to time if circumstances require it, before the sales are conducted.

Name of felling series.	*Coupe.*		*Names of collection depots to which the produce should be transported.*	*Extraction paths allowed.*
	Number.	*Area.*		
(1)	(2)	(3)	(4)	(5)
		ACS.		
			Odugathur Range.	
1 Vellakkal	I	2,490	Malamaduru	All footpaths running through the coupe which ultimately lead to the collection depot or depots and thence to the plains along the Ambur-Asanampet road.
	II	3,315	Pudur and Sengilikuppam.	
	III	3,085	Bamgiarkadai	
2 Panangatteri	I	2,112	Isappa-Naickaneri and Conimadugukadai.	
	II	1,734	Donimadugukadai	
	III	1,338	Thalakalmalai	
3 Asanampet	I	3,597	Gulimalaikadai Orapallam	
	II	2,611	Manjukuttai Kallaparai tank	
	III	2,528	Durgam Bangiarkadai	
4 Naickaneri	I	2,912	Naickaneri	
	II	4,288	Malayappa Naickaneri Vengili	
	III	6,374	Banghi Einar	
5 Karuthamalai	I	4,391	Thirtham Melarasampet	
	II	6,694	Melarasampet Kolandai Goundankottoy	
	III	4,947	Manjakuttai Masimaduvu	
			Vellore Range.	
6 Kottur	I	3,999	Thandavaroyankottai Thurinjikadu	All footpaths running through the coupe which ultimately lead to the collection depot or depots.
	II	3,322	Vairavankoil Jambukadai	
	III	1,639	Kalathumedukadai	
7 Attiyur	I	1,527	Kadukaijonai	
	II	4,256	Vannankolai	
	III	2,574	Magadam	

Name of felling series.	*Coupe.* *Number.*	*Coupe.* *Area.*	*Names of collection depots to which the produce should be transported.*	*Extraction paths allowed.*
(1)	(2)	(3)	(4)	(5)
		ACS.		
			Vellore Range—cont.	
8 Thellai	I	4,836	Veppalanthangal, Pilamarathukadai	All paths running through the coupe which ultimately lead to the collection depot or depots and thence along the Thellai-Kinnikulam road.
	II	4,016	Pilamarathukadai, Kosuguddai	
	III	2,176	Kosuguddai, Pilamarathukadai, Poosagundanvalasai	
9 Komiar	I	1,203	Komiarkadai	All footpaths running through the coupes which ultimately lead to the collection depots.
	II	1,434	Periyanthumalaikadai	
	III	1,690	Kannupuliyamarattukadai.	
			Santavasal Range.	
10 Thongamalai	I	1,719	Komiarkadai, Yeraliarkadai	All footpaths running through the coupe which ultimately lead to the depot or depots.
	II	1,197	Yoraliarkadai	
	III	1,817	Perianthamalaikadai in Komiar coupe III.	The footpath leading to the depot (via) Katheapet.
11 Nayakkanur	I	1,954	Komiarkadai, Yeraliarkadai	All footpaths running through the coupes which ultimately lead from the plateau to the collection depot or depots.
	II	1,599	Perianthamalaikadai in Komiar coupe III.	
	III	947	Kannupuliamarathukadai.	
12 Kudikam	I	1,101	Kudikam, Kannupuliyamaram	Banghi road.
	II	1,434	Kudikam	
	III	998	Kannupuliyamaram	
13 Nekkini	I	1,749	Veppalanthangal	The Palamet-Veppalanthangal footpath along the Godar.
	II	1,424	Amerdi	Thongimarathur-Amerdi and Kolayam Kiranur-Amerdi footpaths.
	III	1,024	Amerdi	
14 Sathampattu	I	1,642	Sathampattu	Latham road.
	II	691	Sathampattu	
	III	1,159	Sathampattu, Pallattur	Pallattur-Sathampattu cart-track and thence along the Latham road.
15 Kanamalai	I	493	Amerdi, Valiyur	The Kanamalai-Amerdi footpath (via) Pichaikanavi.
	II	531	Palaparamput, Valiyur	The footpaths leading west to Palaparamput and east to Valiyur.
	III	877	Palaparamput, Attuparai	The footpath leading west to Palaparamput and east to Attuparai.
16 Nadanur	I	1,728	Serankuppam	Latham road.
	II	1,828	Nadanur	
	III	1,229	Do.	
17 Puliankuppam	I	1,905	Kannikoil, Silliammankoil	All the footpaths running through the coupe which ultimately lead to the collection depots and thence along the cart-track to Santavasal.
	II	1,449		
	III	790		
18 Bonganur	I	1,332	Silliammankoil	The footpaths leading to the depot (via) Pasimodivu.
	II	1,473	Naduthumbakadu	The Patrakad-Chillimalai road.
	III	1,404	Naduthumbakadu	
19 Shembakatope	I	1,645	Shembakatope	All footpaths running through the coupe and ultimately leading to the collection depot and thence along coupes I and III, the cart-track to Santavasal. Coupe II the Thumbakadu-Thaniar cart-track.
	II	2,086	Naduthumakadu	
	III	2,029	Silliammankoil	
20 Santavasal	I	2,400	Koraiarkadi	All footpaths running through the coupe and thence along coupe I, the Shembakatope-Santavasal road, coupe II, the Thumbakadu-Patrakad-Polur and Shembakatope-Santavasal roads, coupe III, the Thumbakadu-Athuvambady path and the Kilur cart-track.
	II	1,363	Naduthumbakadu, Shembakatope	
	III	1,299	Pariyerkadai in Athuvambody.	

Name of felling series. (1)	Coupe. Number. (2)	Coupe. Area. (3)	Names of collection depots to which the produce should be transported. (4)	Extraction paths allowed. (5)
		ACS.		
			Polur Range.	
21 Pudupattu	I	1,830	Burgur	All footpaths running through the coupe which ultimately lead to the collection depot and thence along Bunghi road.
	II	1,562		
	III	1,939		
22 Veerappanur	I	2,042	Burgur	
	II	1,073		
	III	1,146		
23 Mandaparai	I	894	Mandaparai	All footpaths running through the coupe which ultimately lead to the collection depot and thence along the Mandaparai-Burgur-Melarasampet Road.
	II	1,066		
	III	789		
24 Palankottai	I	2,069	Komattiyur	All footpaths running through the coupe which ultimately lead to the collection depot and thence along Gilman Road.
	II	4,486		
	III	864		
25 Thekumarathur	I	723	Komattiyur	
	II	506		
	III	934		
26 Modalapattu	I	410	Komattiyur	
	II	506		
	III	1,038		
27 Odamangalam	I	1,210	Patrakad	All footpaths running through the coupe which ultimately lead to the collection depot and thence along the Patrakad-Chillimalai-Athimoor Road.
	II	1,549		
	III	1,187		
28 Kuttakarai	I	2,641	Patrakad	
	II	1,806		
	III	1,331		
29 Kondikallu	I	1,763	Pudur	All footpaths running through the coupe and along the Pillaiyarnathu path.
	II	2,047		
	III	1,734		
30 Vedatope	I	1,593	Pudur	
	II	755		
	III	811		
31 Pelavadi	I	1,325	Irulavanka	
	II	1,248		
	III	2,004		
			Tiruvannamalai Range.	
32 Valasamalai	I	1,952	Bhimarapatti, Ulchekkadi	All footpaths running through the coupe and finally along coupe I, the footpaths running south of Velkal Hill and from Valasai Hill to the collection depot. Coupes II and III, the Gudaram-Ulchekkadi footpath.
	II	1,738		
	III	1,414		
33 Nattampalli	I	1,350	Ulchekkadi, Attipadi	All footpaths running through the coupes and finally along coupe I, the Ulchekkadi-Attipadi footpath, coupe II, the Erakal-Attipadi Erikal-Pudur-Chekkadi and Tekkampadi-Attipadi footpath coupe III, the Kurumbagounda nur Puddur-Chekkadi and Ayyambadi-Puddur-Chekkadi footpaths.
	II	1,178	Attipadi	
	III	1,274	Pudur	
34 Perunkolathur-swamimalai.	I	659	Neerkumri	All footpaths running through the coupe and finally along coupe I, the Kodiyanur-Kollukuthuppai footpath. Coupe II, the Swamimalai-Navakollai, the Nattaparai-Kodiyanur and the Ayyambadi-Kodiyanur footpaths. Coupe III the Swamimalai-Navakollai footpath.
	II	1,075	Do., Navakollai	
	III	845	Do., Kodiyanur	

353. *Regulation of fellings.*—Fellings will be carried out through the agency of contractors, one coupe in each felling series being worked annually.

The District Forest Officer may, at his discretion on account of common extraction path and collection depot, club more than one coupe as a single unit for purposes of sale, subject to condition that the leases are annual.

354. *Period of lease.*—Till now the system of triennial leases was in force. This system was justified at a time when felling series were newly constituted and the coupes had not been opened up by communications. That stage has long past. Owing to the gregarious flowering of bamboos the bamboo market has been rising. The only way of Government sharing the market is to sell coupes by annual leases. Further a triennial lease shuts out completely the small capitalist and becomes the monopoly of a few rich contractors, who combine at the sales and manage to keep with them particular series or blocks for unduly long periods. Triennial leases will therefore be replaced by system of selling coupes annually. The current triennial leases expire on 31st March 1949 in Polur, Santavasal, Tiruvannamalai and Vellore ranges and on 31st March 1950 in Odugathur range.

SECTION 4—TABULAR STATEMENT OF FELLINGS.

355. The following statement shows the coupes to be worked in each year :—

Serial number and name of bamboo series.	*Year of working.*					
	1949–50.		1950–51.		1951–52.	
	Coupe number.	*Area.*	*Coupe. number.*	*Area.*	*Coupe number.*	*Area.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		ACS.		ACS.		ACS.
I. Odugathur Range.						
1 Vellakkal	II	3,315	III	3,085	I	2,490
2 Panangatteri	II	1,734	III	1,338	I	2,112
3 Asanampet	II	2,611	III	2,528	I	3,597
4 Naickaneri	II	4,288	III	6,374	I	2,912
5 Karuthamalai	I	4,391	II	6,694	III	4,947
II. Vellore Range.						
6 Kottur	I	3,999	II	3,322	III	1,639
7 Attiyur	I	1,527	II	4,256	III	2,574
8 Thellai	I	3,999	II	3,322	III	1,639
9 Komiar	I	1,203	II	1,434	III	1,690
III. Santavasal Range.						
10 Thongamalai	I	1,719	II	1,197	III	1,817
11 Nayakkanur	I	1,954	II	1,599	III	947
12 Kudikam	I	1,101	II	1,434	III	998
13 Nekkini	I	1,749	II	1,424	III	1,024
14 Sathampattu	I	1,642	II	691	III	1,159
15 Kanamalai	I	493	II	531	III	877
16 Nadanur	I	1,728	II	1,828	III	1,229
17 Puliankuppam	I	1,905	II	1,449	III	790
18 Bonganur	I	1,332	II	2,473	III	1,404
19 Shembakatope	I	1,645	II	2,086	III	2,029
20 Santavasal	I	2,400	II	1,363	III	1,299
IV. Polur Range.						
21 Pudupattu	I	1,830	II	1,562	III	1,939
22 Veerappanur	I	2,042	II	1,073	III	1,146
23 Mandaparai	I	894	II	1,066	III	789
24 Palankottai	I	2,069	II	4,486	III	864
25 Thekumarathur	I	723	II	506	III	934
26 Modalapattu	I	410	II	506	III	1,038
27 Odamangalam	I	1,210	II	1,549	III	1,187
28 Kuttakarai	I	2,641	II	1,806	III	1,331
29 Kondikallu	I	1,763	II	2,047	III	1,734
30 Vedatope	I	1,593	II	755	III	811
31 Palavadi	I	1,325	II	1,248	III	2,004
V. Tiruvannamalai Range.						
32 Valasamalai	I	1,952	II	1,738	III	1,414
33 Nattampalli	I	1,350	II	1,178	III	1,274
34 Perungalathur-Swamimalai	I	659	II	1,075	III	845

1952–53	Same as	1949–50	1958–59	Same as	1949–50
1953–54	Do.	1950–51	1959–60	Do.	1950–51
1954–55	Do.	1951–52	1960–61	Do.	1951–52
1955–56	Do.	1949–50	1961–62	Do.	1949–50
1956–57	Do.	1950–51	1962–63	Do.	1950–51
1957–58	Do.	1951–52	1963–64	Do.	1951–52

SECTION 5—OTHER REGULATIONS.

356. *Hacking of* Dendrocalamus strictus.—Mention has already been made in Part I (paragraphs of the most deplorable state of affairs brought about by the wholesale lopping and hacking of *Dendrocalamus strictus* by Malayalees for cattle fodder. Every grazier is allowed to carry a bill-hook in the forest and if this is prohibited much of the damage would disappear. In addition, severe punitive action should be taken against the Malayalees by cancelling, either in whole or in part, the concession of free grazing in blocks where damage is bad.

357. *Overworking by contractors.*—Overworking and general non-observance of felling rules is due largely to the fact that the contractor underpays his labour. On a wage of next to nothing the cutting coolie goes to the forest nearest his village, as near a road or cart-track as possible, and fells and removes as many culms as he can in the quickest and easiest way. The result is that the more accessible areas have been grossly overworked. The coolie is, in most cases, aware of the more important felling rules, but cannot possibly observe them if he is to earn a living wage. Fellings are made over vast areas every year and it is an impossible task for the present staff to see that felling rules are enforced throughout the area. The remedy lies with the contractor and as it would be impracticable to insist on him paying his labour at a reasonable rate, the only solution is the imposition of very heavy fines until he realises the cause of the trouble and takes steps to improve matters. Small fines have been imposed in the past, but appear to have had no effect.

358. *The construction of new roads and extraction cart-tracks.*—In the last working plan, two roads were proposed to be constructed with a view to bringing about a more even distribution of working and exploitation of the areas from which extraction was difficult and expensive. Out of these two roads proposed, one road from Nadanur to Mandaparai was constructed during the currency of the last working plan. The other road from Chinnayampatti to Ulchekkidi proposed to tap the inner slopes of the Ulchekkidi valley in the Nattampalli and Valasamalai reserves has not been constructed. It is now proposed to construct this road during the currency of this working plan.

359. Before making a new cart-track either in or leading to his coupe or felling series the contractor shall obtain the District Forest Officer's approval for the proposed alignment. If required the Range Officer shall be instructed to align a suitable trace for him. The contractor will not be required to pay for the services of the Range Officer or his staff and an endeavour should be made to encourage the contractor to open up his area by rendering him all reasonable assistance.

360. *Grazing.*—Grazing in bamboo areas where seedling has taken place must do a considerable amount of harm to the young regeneration. Nevertheless, it is believed that a sufficient quantity of seedlings will survive to form the ultimate crop. Apart from this, the extent of this working circle is so large that even partial closure will cause great hardship to the local villagers. No grazing restriction is therefore proposed.

361. *Fire protection.*—The protection of the working circle is included in the general scheme of fire protection, which is dealt with under 'Miscellaneous Regulations.' Special measures for the protection of valuable sandal growth occurring in the areas where the bamboo has died have been prescribed in the working plan for the Sandal Working Circle.

362. It should be impressed upon the subordinate staff that special vigilance should be exercised during the fire season in areas where bamboo has died. Carts should not be permitted to remain in the forest during the night, but should be compelled to retire to the nearest enclosure. No fire, for cooking or any other purpose, shall be lighted in forest and anybody found doing so shall be severely dealt with.

CHAPTER V—WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE AREA.

363. *General constitution.*—The Minor Forest Produce Working Circle comprises all the reserves of the division and will also include the unreserves in the following cases :—

(*a*) The unreserves on the Javadi Hills.

(*b*) The unreserves for the purpose of avaram (*Cassia auriculata*) and the Konnai (*Cassia fistula*) bark leases.

364. *Subdivision of the area with reference to the various kinds of produce.*—A list of minor forest produce has been furnished in paragraph 101. For the collection of barks and nux-vomica the unit of working will be a range. Quarries will be leased separately

or in groups where there are more than one quarry in a locality. For collection of other produce the area has been sub-divided into 19 farms. This sub-division is set forth in the following statement and is shown on the minor forest produce working map :—

Serial number and range. (1)	Farm. Name of farm. (2)	Area. (3)	Constitution. (4)
		ACS.	
1 Odugathur	Ambur	50,565	Vellakal Reserve. Ambur Fuel Reserve. Ambur Reserve. Shanankuppam Reserve, Ambur plantation.
2 Do.	Karuthamalai	20,146	Karuthamalai Reserve, Arasampattu rest-house compound.
3 Vellore	Alleri	15,435	Nellimalai Reserve, Appukallu Reserve. Arasampattu Reserve that part west of the Thattankuttai-Attiyur footpath.
4 Do.	Odugathur Plain	4,327	Komiar Bamboo Felling Series.
5 Do.	Thellai	18,218	Kylasagiri Reserve, Attiyur Reserve. Thellai Reserve that part situated in the Vellore Range. Arasampattu Reserve that part east of the Thattankuttai-Attiyur footpath.
6 Santavasal	Odugathur Hill	12,765	Nayakanur Bamboo Felling Series, Arasampattu Reserve, Kudikam Bamboo Felling Series. Arasampattu and Puttur Reserves. Thongamalai Bamboo Felling Series, Thellai and Puttur Reserves.
7 Do.	Amerdi	22,145	Nekkini Bamboo Felling Series, Puttur and Thellai Reserves. Sathampattu Bamboo Felling Series, Puttur, Thellai and Malayalam Reserves. Kanamalai Bamboo Felling Series, Malayalam Reserve. Nadanur Bamboo Felling Series, Malayalam and Puttur Reserves. That part of the Thellai and Malayalam Reserves, around and south of Amerdi not included in any bamboo felling series.
8 Do.	Shembakatope	19,175	Puliyankuppam Bamboo Felling Series, Malayalam Reserve. Bonganur Bamboo Felling Series, Malayalam Reserve. Shembakatope Bamboo Felling Series. Malayalam Reserve. Santavasal Bamboo Felling Series, Santavasal and Santavasal 'A' Extension.
9 Do.	Santavasal	5,004	Santavasal Reserve excluding Santavasal Bamboo Felling Series, Santavasal 'B' Extension.
10 Do.	Karnatagiri	7,270	Karnatagiri Reserve.
11 Do.	Vellimalai	2,003	Vellimalai Reserve.
12 Polur	Arasampattu	12,341	Veerappanur Bamboo Felling Series, Veerappanur Reserve, Mandaparai Bamboo Felling Series, Veerappanur Reserve, Pudupattu Bamboo Felling Series, Arasambattu and Veerappanur Reserves.
13 Do.	Komattiyur	12,663	Palankottai Bamboo Felling Series, Veerappanur Reserve. Tekumarathur Bamboo Felling Series, Veerappanur Reserve. Modalapattu Bamboo Felling Series, Veerappanur Reserve.
14 Do.	Chillimalai	23,793	Patrakad Reserve.
15 Do.	Moolakad	15,529	Moolakad Reserve. Moolakad rest-house compound.
16 Do.	Periamalai	6,970	Periamalai Reserve. Thaniar rest-house compound.
17 Do.	Alliyalamangalam.	7,521	Alliyalamangalam Reserve.
18 Tiruvannamalai	Ponniar	26,897	Ponniar Reserve, that part situated in the Vellore East Division.
19 Do.	Kalroyan	25,936	Valasamalai Reserve. Nattampalli Reserve. Perungalathur-Swamimalai Reserve. Pavunjipattu Reserve. Royandapuram Reserve that part not under panchayat management.

NOTE.—Farm Nos. 6 to 16 (except farm No. 11) also include small areas of unreserves situated on the Javadi Hills.

The two panchayat forests Allialamangalam and Vellimalai recently taken over by the Forest department in Polur and Santavasal Ranges respectively have been constituted as separate farms.

The usufructs of 14 tamarind trees on the Santavasal-Shembakatope road may be sold separately or with either the Santavasal or Shembakatope farms.

365. In addition to the above the Banavaram Reserve, 1,065 acres and the following plantations will constitute separate units and may be sold separately for two or more together whenever there is a demand :—

	ACS.		ACS.
Tiruvallam	464	Chennur	130
Kilminnal (bits 1 and 2)	150	Vikramachi	129
Vannivedu	57	Ammundi	163
Virinchipuram	258		

SECTION 2—METHOD OF TREATMENT.

366. *Konnai bark* (Cassia fistula).—Konnai bark will be worked on a five-year rotation as it has been found that the maximum production of tanning is obtained in this period. Each range, including unreserves, except those under panchayat management, will be sold in auction in June every fifth year, but the period of collection will be for one year only from the 1st of July in the year of the sale to the 30th of the following June.

367. *Avaram* (Cassia auriculata) bark will be worked on a three-year rotation, as the bark improves considerably if it is worked once in three years. Each range including unreserves except those under panchayat management will be sold in auction in June every third year, but the period of collection will be for one year only from the 1st of July in the year of the sale to the 30th of the following June.

368. *Surul* (Ventilago spp.) bark.—Each range, including unreserves, except those under panchayat management, will ordinarily be sold in auction in June each year. If, however, there is a demand, and if the District Forest Officer considers it desirable, the right may be sold on a biennial or triennial lease. The lease period will begin on the 1st July in the year of the sale.

369. *Quarries*.—The period of lease is left to the discretion of the District Forest Officer but it shall not exceed three years. The lease will begin, as in the case of other minor forest produce, on the 1st of July in the year of the sale.

370. *Other produce*.—The right to collect and remove all other produce will be sold in auction in June each year and the lease will be for one year from the 1st of July to the 30th of June. As a general rule each farm will be sold separately, but if occasion arises and the District Forest Officer deems it necessary, two or more farms may be clubbed together, or any particular produce for which a special demand may arise, sold separately. Nux-vomica will be included with other produce in all ranges except Tiruvannamalai, where the range, including unreserves but excluding reserves under panchayat management, will be the unit of sale.

371. *Departmental working*.—Occasion may arise when for various reasons, at present unforeseen, it may become desirable to work any particular produce departmentally. It is, therefore, prescribed that, while exploitation through contractors should be the general rule, departmental working may be resorted to, with the prior sanction of the Conservator, whenever such a procedure seems necessary or expedient.

372. *Malayalee labour*.—Past records show that there is generally a clash of interest between the departmental contractors and the Malayalees and the plainsmen in spite of the fact that the contractors have been instructed to be very fair in dealing with the Malayalees and their patta produce. This position can be eased if the minor forest produce contractors would only treat the Malayalee by paying them a reasonable price. Hence the following additional clause is prescribed to be added on to the minor forest produce agreements :—

" The contractors are warned to pay a reasonable price for the patta produce supplied by the Malayalees, in order to avoid a clash between the contractors and the Malayalees and the Plainsmen."

SECTION 3—IMPROVEMENT OF MINOR FOREST PRODUCE SPECIES.

373. *Object of management*.—The artificial introduction of trees yielding valuable minor forest produce is becoming an imperative necessity. There is not at present adequate natural regeneration of the more valuable species such as *Terminalia chebula*. Therefore, to this end in view an area will be regenerated on experimental basis.

374. *Selection of area*.—An area of about 75 acres in Veerapanur Reserve, south of Mandaparai rest-house, have been selected for the purpose. Every year five acres will be taken up and regenerated with *Terminalia chebula* by the 'kumri' method.

375. *Method of treatment—Demarcation*.—The annual coupe of five acres will be demarcated by lines five feet wide on the ground to be cleared of all growth and be normally bounded by not more than four straight lines. It will be surveyed by the end of September preceding the year of regeneration. The land to be allotted to kumridars shall be handed over by the end of December at the latest.

376. *Selection of kumridars*.—The kumridars will be selected from among the landless Malayalees of Mandaparai or adjacent villages. The writer has consulted the Malayalees of Mandaparai, who are readily willing to take up the area for 'kumri' cultivation under regulations stipulated by the department.

377. *Issue of permits under section 21 of Madras Forest Act.*—The District Forest Officer shall issue to each of the selected kumridar a permit under section 21 of the Madras Forest Act in respect of the forest land allotted to him for ' kumri ' cultivation. The permit will be renewed annually, for five years. At the expiry of five years, the area will revert to the Forest department.

378. The permit under section 21 shall contain suitable conditions, which should aim at safeguarding the interest of the Forest department in regard to the successful regeneration of the area concerned and in all other aspects such as protection of the adjoining forests from theft of forest produce, from illicit grazing, from fire, etc. As the success of kumri method of regeneration will depend on the willing co-operation of the kumridars, care should be taken not to include any condition in the permit, which will cause undue hardship to the kumridars.

379. *Clearing.*—All trees and shrub growth except sandal will be clear-felled by the kumridars, who will fence the coupe adequately against cattle and wild animals with the useless felled material. All saleable felled material over three inches in girth will be allowed to be appropriated by the kumridar for his own use. Felled material left in the coupe unutilized will be burnt under departmental supervision by the kumridar on the area, the ashes being immediately mixed with the soil to prevent dispersal by wind. Clearing and burning should be completed by 15th April of the year of regeneration.

380. *Layout.*—The layout will be by means of pits one foot cube at an espacement of 30 feet × 30 feet. The pits will be dug during the month of May, and the excavated soil refilled into the pits after allowing the soil to weather for a few weeks. Seeds will then be dibbled in the loose soil by the end of June or beginning of July. Each pit will then be fenced with brushwood about $1\frac{1}{2}$ feet high tapering towards the top, which would provide the necessary shade to the plants and prevent kumridars from damaging the seedlings. These fences should be maintained in good repair until the seedlings are about 2 feet high.

381. *Choice of species and sowing.*—Only *Terminalia chebula* will be tried. In each pit two to four good seeds will be sown. In pits where the seeds have not germinated resowings will be done in September.

382. *Weeding and soil working.*—The seedlings will be kept free of weeds. The soil should be worked round the plants in September and February, taking care not to damage the root system.

383. *Watering.*—Watering at the rate of half a potful or one gallon of water should be done at least once in a week during break in the rains. After the seeds have germinated, watering may not be essential but in cases of prolonged and unexpected drought, watering should be done sufficient to keep the young seedlings alive.

384. *General.*—If kumridars are not forthcoming, the work should be done departmentally. If this experiment proves a success, this method of regeneration may be adopted to improve the minor forest produce in suitable localities which are available around the enclosures on the Javadis.

In his No. 858/47-C, dated 5th April 1948, the Conservator of Forests, Salem Circle, suggested the planting of tamarind trees systematically along the margins of all forest roads as one of improvements of minor forest produce. This was approved by the Chief Conservator of Forests and will be followed.

Already instructions have been issued by the Conservator of Forests, Salem Circle, to the District Forest Officer, Vellore East, to begin work from 1948–49. Hence no special prescription is made in the working plan, but this work will be continued every year

CHAPTER VI—WORKING PLAN FOR THE GREEN LEAF MANURE WORKING CIRCLE.

SECTION 1—INTRODUCTION.

385. The prescriptions for this working circle are based on the instructions issued in paragraph 2 of G.O. Mis. No. 2268, Development, dated 20th December 1929 in as far as they concern the Vellore East Division, and in G.O. Ms. No. 2220, Development, dated 17th October 1942. Briefly these instructions are that removals should be permitted in

(*a*) the reserves of the Vellore and Odugathur ranges (the Gudiyattam, Arkonam, Walajapet and Vellore taluks of the old Vellore North Division) at Re. 0–12–0 per cart-load ; and

(*b*) those reserves of the Santavasal, Polur and Tiruvannamalai ranges (the old Vellore South Division) which in the opinion of the Chief Conservator can be thrown open for such removals at Re. 1 per cart-load.

386. From paragraph 3 of G.O. Ms. No. 2268, Development, dated 20th December 1929, it is seen that Government are not in favour of replacing the present permit system by a system of annual coupes.

387. *Demand.*—North Arcot being one of the rice producing districts there is keen demand for green leaf manure for wet cultivations. After the preparation of the previous working plan, some justification was found to increase the area and so the original prescription was amended in Chief Conservator's D. Dis. No. 797/40, dated 13th June 1942. According to the last working plan the area of the working circle was 17,580 acres comprising of 12 blocks. This was increased subsequently as per the orders of the Chief Conservator quoted above to 39,706 acres of 14 felling series of three coupes each, each coupe being worked annually by issuing permits.

SECTION 2—AREA AND CONSTITUTION OF THE CIRCLE.

388. The area of the present working circle is 44,407 acres comprising of 18 series. Large areas of forest unsuitable for any other type of working and which are accessible have now been included in this working circle. The area of the working circle has been increased, in order to spread the demand over a larger area and thereby to save the forest from ruin and to enable the ryots to obtain an adequate supply of green leaf manure for their needs.

The following statement shows the constitution of the green leaf manure working circle, in various manure leaf series the division into coupes and their areas :—

Range. (1)	*Reserved forest.* (2)	*Serial number and name of green manure leaf felling series.* (3)	*Number of coupes.* (4)	*Area of the coupe in each.* (5)	*Area of the felling series.* (6)
				ACS.	ACS.
Vellore ..	Appukal Arasampet (part) and Nellimalai.	1 Appukal	Coupe No. I ..	1,042	2,579
			Do. II ..	831	
			Do. III ..	706	
Do. ..	Kylasagiri	2 Kylasagiri ..	Coupe No. I ..	876	2,178
			Do. II ..	651	
			Do. III ..	651	
Odugathur ..	Karuthamalai (part).	3 Odugathur ..	Coupe No. I ..	1,040	2,154
			Do. II ..	547	
			Do. III ..	567	
Do. ..	Shanankuppam ..	4 Kuppampalayam..	Coupe No. I ..	908	2,896
			Do. II ..	1,154	
			Do. III ..	834	
Do. ..	Do. ..	5 Agaram	Coupe No. I ..	1,091	2,470
			Do. II ..	706	
			Do. III ..	673	
Do. ..	Do.	6 Pachakuppam ..	Coupe No. I ..	1,820	3,818
			Do. II ..	1,200	
			Do. III ..	798	
Do.	Do.	7 Nacharkuppam ..	Coupe No. I ..	1,133	3,251
			Do. II ..	1,156	
			Do. III ..	962	
Do. ..	Vellakkal	8 Vellakkal	Coupe No. I ..	302	1,454
			Do. II ..	589	
			Do. III ..	563	
Santavasal ..	Malayalam	9 Attuparai ..	Coupe No. I ..	1,119	3,459
			Do. II ..	1,022	
			Do. III ..	1,318	
Do. ..	Santavasal (part) ..	10 Santavasal ..	Coupe No. I ..	665	2,952
			Do. II ..	1,342	
			Do. III ..	945	
Do. ..	Do. ..	11 Athuvambady ..	Coupe No. I ..	450	1,796
			Do. II ..	487	
			Do. III ..	859	
Do. ..	Karnatagiri (part) ..	12 Karnatagiri ..	Coupe No. I ..	850	1,977
			Do. II ..	658	
			Do. III ..	469	
Do. ..	Vallimalai	13 Vallimalai ..	Coupe No. I ..	854	2,003
			Do. II ..	556	
			Do. III ..	593	

Range.	Reserved forest.	Serial number and name of green manure leaf felling series.	Number of coupes.	Area of the coupe in each.	Area of the felling series.
(1)	(2)	(3)	(4)	(5)	(6)
				ACS.	ACS.
Polur ..	Periamalai (part) ..	14 Periamalai (East).	Coupe No. I ..	404	2,312
			Do. II ..	930	
			Do. III ..	978	
Do. ..	Mulakad (part) ..	15 Periamalai (West).	Coupe No. I ..	316	1,588
			Do. II	510	
			Do. III ..	762	
Do. ..	Alialamangalam ..	16 Alialamangalam (North).	Coupe No. I ..	866	2,268
			Do. II ..	714	
			Do. III ..	688	
Do. ..	Do. ..	17 Alialamangalam (South).	Coupe No. I	1,052	3,212
			Do. II ..	1,182	
			Do. III ..	978	
Do. ..	Do. ..	18 Alialamangalam (East).	Coupe No. I ..	464	2,040
			Do. II ..	819	
			Do. III ..	757	
				Total ..	44,407

SECTION 3—METHOD OF TREATMENT.

389. *System.*—The coupe system is clearly the least harmful to the forest, but government are definitely opposed to its introduction. In accordance with orders issued in G.O. Ms. No. 86-S, dated 6th May 1942 and Chief Conservator's No. 393/42-A, dated 20th July 1942, thereon the coupe system has been replaced by the permit system. Permits will be issued at Re. 1 per cart-load and at Re. 0–1–0 per head-load for removals of green leaf manure in Santavasal, Polur and Tiruvannamalai ranges ; and at Re. 0–12–0 per cart-load and Re. 0–0–9 per head-load for removals in Vellore and Odugathur ranges until further orders. Permits will be issued departmentally by Rangers and authorized Foresters for the coupe of the year. The permits will be issued from 1st July to 31st January.

390. *Rules regulating cutting and removal.*—Ryots take usually all species which are not thorny. No ryot can resist the temptation to cut *Chloroxylon swietenia, Anogeissus latifolia, Anogeissus acuminata Albizzia amara* and *Cassia siamea.* To restrict removal of species hampers administration. It is, therefore, proposed that only the following rules regarding cutting and removal of green manure leaf shall be enforced :—

(*a*) Only twigs not bigger in girth than one's thumb shall be cut.

(*b*) Sandal, teak, rosewood and *Pterocarpus marsupium* are prohibited species and shall not be cut.

(*c*) Removals from the forest shall take place only by day.

(*d*) Removals shall be restricted to villages which are not served by panchayats.

(*e*) The cutting shall be done by means of a sharp knife or sickle, with one clear cut.

SECTION 4—ARTIFICIAL REGENERATION OF MANURE LEAF SPECIES.

391. *Object of management.*—The object of management is to convert suitable areas in the manure leaf series into manure leaf plantation by the 'Kumri' method, with a view to meet the existing demand for such produce and also to provide for future expansion to meet increased demand.

392. *Division of felling series.*—The total area selected is about 400 acres and are situated into different ranges, thus forming two series Vellakal and Alialamangalam of 200 acres each as shown in the fuel map.

Vellakkal Series—Vellakkal Reserved Forest, Odugathur Range.

Alialamangalam Series—Alialamangalam—Reserved Forest, Polur Range.

393. Every year five acres will be marked in each series and regenerated with suitable species. If the Kumridars are forthcoming and if the scheme proves successful, the District Forest Officer can increase the area of the annual coupe as he deems fit.

394. *The period of cultivation* of each coupe by the Kumridars will be limited to five years after which it is anticipated that the tree crop will provide too much shade to admit of further cultivation of field crops.

395. *Felling cycle.*—The manure leaf crop will be allowed to grow for five years and then the tree species will be lopped for manure leaf on a three-year felling cycle. All shrubby growth will be clear-felled at the time of each lopping. But the growth is found luxuriant and fit for exploitation earlier than five years, the District Forest Officer on his own discretion, after obtaining Conservator's sanction can exploit the coupe earlier.

396. *Kumridars required.*—Each kumridar is to be given not more than 2½ acres each. For each series ten kumridars will be required for the first five years. If kumridars are not readily forthcoming, the work must be carried out departmentally.

397. *Method of treatment—Demarcation.*—The annual coupe will be demarcated by lines 10 feet wide on the ground to be cleared of all growth and be bounded by not more than four straight lines. It will be surveyed by the end of September *preceding* the year in which it is prescribed for regeneration. The felling series letter and coupe number will be inscribed on a stone slab embedded in the ground at the corners of the coupe.

398. *Selection of kumridars.*—The kumridars will be selected from among the landless poor. An area of 2½ acres should be allotted to each kumridar as this is the minimum from which a subsistence crop can be raised. The Range Officer will select kumridars on these lines and report to his District Forest Officer their names and areas allotted to each by the end of October preceding the year of regeneration and obtain orders.

399. *Issue of permits under section 21 of the Madras Forest Act.*—The District Forest Officer shall issue to each of the selected kumridar a permit under section 21 of the Madras Forest Act in respect of the Forest land allotted to him for 'kumri' cultivation. The permit will be renewed annually for five years. At the expiry of five years, the area will revert to the Forest Department.

400. The permit under section 21 shall contain suitable condition, which should aim at safeguarding the interest of the Forest department in regard to the successful regeneration of the area concerned and in all other aspects such as protection of the adjoining forests from theft of forest produce, from illicit grazing, from fire, etc. As the success of 'kumri' method of regeneration will depend on the willing co-operation of the kumridars, care should be taken not to include any condition in the permit, which will cause undue hardship to the kumridars.

401. *Sowing.*—The soil will then be prepared in the usual manner by kumridars. The best method of regeneration in this type of forest is by direct sowing. As soon as the burn of the lop and top is over, the lines are to be prepared for the forest crop and these should be two feet wide and 32 feet apart from centre to centre or 30 feet apart from edge to edge. These lines will run approximately along the contours on slopes. As the forest species to be introduced are fast growing 30 feet is set apart for agricultural crop. The best period for sowing is June-July and this is also about the same time the ryots usually sow their agricultural crops in this district. Resowing must be done at reasonable intervals until a full stocking is obtained. In the sixth year before the kumridars vacate the plot in favour of a new plot, he will plough up the area and sow with good grass seeds, to be supplied by the department. Species recommended are (1) *Cassia siamea*, (2) *Wrightia tinctoria*, (3) *Pongemia glabra*, (4) *Dodonea viscosa*, (5) *Cassia montana* and (6) *Poinciana elata*.

402. *Soil working.*—The forest crop will be soil worked by the kumridars under departmental supervision at least three times a year. The growth of tree crop is so greatly dependant on good soil working that this should on no account be neglected.

403. *Grazing.*—The coupes will be closed for grazing from the year of formation. Removal of fodder grass, if available, in the coupes may be allowed free at the discretion of the District Forest Officer.

404. *Protection.*—The area should be protected from fire.

405. *Financial forecast.*—As the work is done for the first time in this division, as an experimental measure, no financial forecast is given.

CHAPTER VII—WORKING PLAN FOR THE GRAZING WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE CIRCLE.

406. *Constitution.*—The Grazing Working Circle comprises of all the reserves of the division with the exception of the undermentioned areas :—

	ACS.
Banavaram reserve	1,065
Ambur plantation	6
Vannivedu plantation	57
Tiruvallam plantation	464
Kilminnal plantation	150
Ammundi plantation	163
Virinchipuram plantation	258
Chennur plantation	130
Vikramachi plantation	129

SECTION 2—METHOD OF TREATMENT.

407. *Introduction.*—The damage caused by grazing has been referred to in paragraphs 84 and 85. It has also been shown that the grazing incidence is high, but it is doubtful if the present policy of Government will permit of any reduction in the number of cattle which are grazed annually in reserves. Provision must, therefore be made to meet the full grazing requirements of villages dependant on reserves for pasture.

408. The objects of management are thus—

(i) to provide pasture for the cattle of villages in the vicinity of reserves and in the enclosures situated therein, consistant with the protection of newly felled areas, and to derive a legitimate amount of revenue, and

(ii) to control the exercise of grazing concessions granted to the Malayalees in the hill villages of the Vellore, Santavasal and Polur ranges.

409. *Prescriptions.*—The following general prescriptions will apply throughout the working circle :—

(i) The grazing year will be from 1st July to 30th June.

(ii) Goat browsing will not be allowed.

(iii) Worked fuel coupes will be closed to grazing for a period of four years, including the year of felling.

Detailed prescriptions vary with the area, depending on whether grazing concessions exist or not, and are dealt with in the following sections.

SECTION 3—AREAS WHERE NO GRAZING CONCESSIONS EXIST.

410. In areas where no concessions exist, grazing will be regulated by the issue of permits subject to the usual conditions. The rates charged will be those sanctioned by the Government from time to time. A distinction is made between ' local ' and ' foreign ' cattle, the rates for the latter being double those for the former. No authoritative definitions of ' local ' and ' foreign ' cattle, as applicable to the division hitherto, can be traced. The present procedure is to class as ' local ' cattle which remain in the division throughout the year, all others being ' foreign '. The following definitions are now prescribed (vide Chief Conservator's No. 7077/37-C. 1, dated 2nd September 1937) :—

Local cattle.—Cattle whose owners reside within the limits of the Forest division.

Foreign cattle.—Cattle whose owners reside outside the limit of the Forest division.

411. Permits will be valid for one season only and will be issued by an Officer not below the rank of Forester.

SECTION 4—GRAZING CONCESSIONS.

412. The following concessions will continue :—

(i) Free grazing under the ' Forest Village System ' by the Malayalees of the Javadi Hills in the Santavasal and Polur ranges (G.O. No. 2687, dated 3rd December 1915) and of that part of the Thellai Reserve situated in the Vellore Range (Chief Conservator's Reference No. 4411/37-C-2, dated 16th December 1937).

(ii) Grazing on payment of half the usual fees by the Malayalees of the Attiyur and Arasampet reserves of the Vellore Range (G.O. No. 1720, dated 25th May 1910).

Free grazing under the ' Forest Village System ' by the Malayalees of the Javadi Hills in the Santavasal and Polur ranges, and of that part of the Thellai Reserve situated in the Vellore Range.

413. *Terms of concession.*—These have been dealt with in paragraphs 39 (*a*) and 120. No alteration or modification is called for.

414. *Grazing blocks.*—The 152 grazing blocks into which the areas has already been divided will continue. The statement below sets forth the names and areas or the blocks, the reserves in which they are situated and the village or villages to which each has been allotted. Tracings of the blocks, from four inches Survey of India sheets, have been recorded

in the Control journals for the Santavasal, Polur and Vellore ranges. It has, therefore, been considered unnecessary to furnish boundary descripton here or to provide a working map for the control of grazing.

List of grazing blocks under the 'Forest Village System' in the Santavasal, Polur and Vellore ranges.

Grazing block. Serial number and name. (1)	Area in acres (reserve only). (2)	Name of reserve or reserves in which situated. (3)	Name of village or villages to which allotted. (4)
		Santavasal Range.	
1 Yelavandapudur	578	Arasampattu and Tellai	Yelavandapudur.
2 Muthanur	640	Arasampet	Muthanur.
3 Elluparai	142	Do.	Elluparai.
4 Nayakanur	652	Do.	Nayakanur.
5 Kavaliyur	148	Do.	Kavaliyur.
6 Sinnattipatti	200	Thellai	Sinnattipatti.
7 Kunrani	450	Do.	Kunrani.
8 Eladimarathur	350	Do.	Eladimarathur.
9 Periya Ettipatti	315	Thellai and Puttur	Periya Ettipatti.
10 Thethur	50	Puttur	Thethur.
11 Konur	60	Do.	Konur.
12 Chengadu	200	Do.	Chengadu and Tekumarathur.
13 Thongamalai	350	Do.	Thongamalai.
14 Mulanur	475	Do.	Mulanur.
15 Pilliyar kuttai	140	Arasampet	Pillaiyarkuttai.
16 Selathur	84	Do.	Selathur.
17 Thennadur	175	Arasampet and Puttur	Thenandur and Korathur.
18 Pudur	538	Do.	Pudur.
19 Pinjamanthai	440	Arasampet	Chinnapinjamanthai and Periapinjamanthai.
20 Kunikanur	220	Do.	Kunikanur.
21 Perikottanchetti	184	Do.	Periakottanchetti.
22 Sinnakkottanchetti	200	Do.	Sinnakottanchetti.
23 Narasimadubu	50	Do.	Narasimadubu.
24 Kattiyapattu	530	Do.	Kattiyapattu and Pallandur.
25 Kuppachiyur	286	Do.	Kuppachiyur.
26 Puliyamarathur	750	Arasampet and Puttur	Puliyamarathur.
27 Kudigam	560	Do.	Kudigam.
28 Koraimadubu	275	Do.	Koraimadubu.
29 Periapanapparai	850	Do.	Periappanapparai.
30 Chinnapanapparai	175	Do.	Chinnapanapparai.
31 Chinnur	350	Do.	Chinnur.
32 Puttur	425	Do.	Puttur and Desariputtur.
33 Namiyampattu	975	Puttur	Namiyampattu.
34 Periaveerappattur	190	Do.	Periaveerappattur.
35 Veliyur	300	Do.	Velliyur.
36 Kattayangudisai	150	Do.	Kattayangudisai and Kabadigudisai.
37 Melkuppachinnur	600	Puttur and Thellai	Melkuppachinur.
38 Pelamuthu	697	Do.	Pelamuthu and Salathumadugu.
39 Nikkini	1,100	Thellai	Nekkini and Thanimarathur.
40 Kolayam	432	Do.	Kolayam and Kuranur.
41 Kanamalai	650	Malayalam	Kanamalai.
42 Arasanur	520	Do.	Arasanur.
43 Elanthampattur	740	Do.	Elanthampattur.
44 Kilkuppachinur	350	Puttur	Kilkuppachinnur, Sinnabeerappattu and Patrayangudisai.
45 Mothalamadubu	125	Do.	Mothalamadubu.
46 Serankuppam	425	Puttur and Thellai	Seranankuppam and Melsernankuppam.
47 Thathankuppam	125	Do.	Thathankuppam.
48 Pattanur	312	Puttur, Thellai and Malayayalam.	Pattanur.
49 Sinthanikuppam	40	Puttur	Sinthanikuppam.
50 Muthanthur	320	Puttur and Malayalam	Muthanathur.
51 Nadupat	40	Thellai	Nadupat.
52 Nadanur	150	Puttur	Nadanur.
53 Eriyur	250	Do.	Eriyur.
54 Sinnamachur	45	Do.	Sinnamachur.
55 Seramarathur	100	Do.	Seramarathur.
56 Padavanur	170	Do.	Padvanur.
57 Kovilur	50	Do.	Kovilur and Chinnakovilur.
58 Koilandur	275	Do.	Koilandur.
59 Kumbilur	425	Do.	Kumbilur.
60 Valathumbi	775	Do.	Valathumbi.
61 Pallathur	320	Malayalam	Pallathur and Avaramvalasai.
62 Nagalur	260	Do.	Nagalur.
63 Nirthumbi	600	Do.	Nirthumbi.
64 Murukkamandai	1,280	Do.	Murukkamandai and Melamurukkamandai.
65 Malligamaduvu	172	Do.	Malligimaduvu.
66 Kanavayur	450	Do.	Melkanavayur.
67 Puliyankuppam	750	Do.	Puliyankuppam and Melpuliyankuppam.
68 Kammampattu	200	Do.	Kammmapttu.
69 Sengadu	400	Do.	Sengadu.
70 Puduppattuvali	150	Do.	Puduppattuvali.
71 Bonganur	470	Do.	Bonganur.
72 Periyavali	660	Do.	Periyavali.
73 Pathimala	600	Do.	Pathimala.

Grazing block. Serial number and name. (1)	*Area in acres (reserve only).* (2)	*Name of reserve or reserves in which situated.* (3)	*Name of village or villages to which allotted.* (4)
		Santavasal Range—cont.	
74 Periyamachur	30	Puttur	Machur.
75 Thoniyur	40	Thellai	Thoniyur.
76 Sathampattu	498	Thellai and Malayalam ..	Sathampattu.
77 Palapparampattu	2,474	Do. ..	Palapprampattu.
78 Amerdi	1,200	Do. ..	Amerdi.
79 Poosangundanvalasai ..	700	Puttur and Thellai ..	Poosangundanvalasai.
		Polur Range.	
80 Komittiyeri	900	Veerappanur	Komittiyeri.
81 Melkomittiyur	204	Do.	Melkomittiyur.
82 Velikottai	240	Do.	Velikottai.
83 Palankottai	900	Do.	Palankottai.
84 Gunikanur	450	Do.	Gunikanur.
85 Mamarathur	302	Veerappanur and Patrakad.	Mamarathur.
86 Kuriyanur	132	Veeppanur	Kuriyanur.
87 Melnellimarathur	375	Do.	Melnellimarathur.
88 Erinellimarathur	200	Do.	Erineltimarathur.
89 Keelur	430	Do.	Keelur.
90 Seramarathur	340	Veerapanur and Patrakad.	Seramarathur.
91 Jambodi	300	Do.	Jambodi
92 Tekamarathur	380	Veerappanur	Tekamarathur.
93 Gundalattur..	186	Veerappanur and Patrakad.	Gundalattur.
94 Berinellimarathur	440	Veerappanur	Berinellimarathur.
95 Perungattur	885	Patrakad and Veerappanur.	Perungattur.
96 Alanjanur	460	Veerappanur	Alanjanur.
97 Chintalur	500	Do.	Chintalur.
98 Kanaganeri	326	Do.	Kanaganeri.
99 Markanur	530	Do.	Markanur.
100 Pakkamadayanur.. ..	560	Do.	Pakkamadayanur.
101 Jamnamarathur	1,580	Do.	Jamnamarathur.
102 Mandaparai	900	Do.	Mandaparai.
103 Kallaparai	310	Do.	Kallaparai
104 Melmarathur	452	Do.	Melmarathur.
105 Jadayanur	500	Do.	Jadayanur.
106 Arasavali	500	Do.	Arasavali.
107 Burgur	2,630	Do.	Burgur.
108 Ettimarathur	936	Do.	Ettimarathur.
109 Pudupattu	3,450	Do.	Pudupattu.
110 Vilankuppam	1,180	Do.	Vilankuppam.
111 Thithanur	1,120	Veerappanur and Patrakad	Thithanur.
112 Veerappanur	430	Veeppanur	Veerappanur.
113 Jonur	260	Do.	Jonur.
114 Periyamalai	608	Patrakad	Periyamalai.
115 Thumbakkollai	432	Do.	Thumbakkollai.
116 Odamanagalam	1,376	Do.	Odamangalam.
117 Peruvali	764	Do.	Perivalli.
118 Padri	268	Patrakad and Veerappanur.	Padri.
119 Manjuthu	230	Patrakad	Manjathu.
120 Kuttakarai	2,350	Do.	Kuttakarai.
121 Pattankovilur	360	Do.	Pattankovilur
122 Kallathur	476	Do.	Kallathur.
123 Patrakad	662	Do.	Patrakad.
124 Kondikallur	1,700	Patrakad and Moolakad.	Kondikallur.
125 Melchipalli	1,350	Do.	Melchippalli.
126 Kilchippalli	1,752	Moolakad	Kilchipalli.
127 Pudur	1,260	Patrakad	Pudur and Mamarathur.
128 Ambattankollai	930	Do.	Ambattankollai.
129 Vedatope	400	Do.	Vedatope.
130 Koyilanur	940	Do.	Koyilanur.
131 Athipattu	500	Veerappanur	Athipattu
132 Koilur	480	Veerapannur and Patragad.	Koilur.
133 Mattukanur	440	Veerappanur	Mattukanur.
134 Dombarathu	420	Veerappanur and Patrakad.	Dombarathu.
135 Thanjankollai	1,660	Do.	Thanjankollai.
136 Mothalapattu	720	Veerappanur	Mothalappattu.
137 Mamarathur	250	Do.	Mamarathur.
138 Kilthattiyapattu	136	Patrakad	Kilthattiyapattu.
139 Palveri	1,004	Patrakad and Mulakad ..	Palveri.
140 Gumbalamarathur	452	Veerappanur	Gumbalamarathur.
141 Jeemarathur	765	Veerappanur and Patrakad.	Jeemarathur.
142 Attiyanur	944	Do.	Attiyanur.
143 Mullipattu	280	Do.	Mullipattu.
144 Pelavadi	940	Patrakad	Pelavadi.
145 Nasimalaikottai	480	Veerappanur	Nasimalaikottai.
146 Thumbakad	808	Malayalam and Muladad ..	Thumbakad.
		Vellore Range.	
147 No. I	894	Thellai	Periyathathankuttai.
148 No. II	1,020	Do.	Sinnathathankuttai and Jarathankollai.
149 No. III	1,223	Do.	Thellai, Muthangudisai and Kadugamarathur.
150 No. IV	680	Do.	Neeplambat and Kondathur.
151 No. V	2,085	Do.	Erimodu and Pattigudisai.
152 No. VI	751	Do.	Pudur, Kanisai and Chinnakanisai.
Total area ..	88,565		

415. *Refund of grazing fees.*—It has been customary in the past to refund grazing fees at the time when rewards for successful fire protection are disbursed. This custom will continue. In a later chapter, it is prescribed that fire protection rewards shall be paid early in October each year. The grazing year ends on the 30th June, so that a clear period of three months remains for inspection of grazing blocks by Range Officers, the submission of their reports on the degree of protection and co-operation attained and receipt of the Conservator's sanction which is necessary before the refunds can be made.

416. *Thellai Reserve.*—In C.C.P. No. 324, Mis., dated 13th July 1922, the "Forest Village System" was tentatively introduced in that part of the Thellai reserve situated in the Vellore Range. Prior to that date, the villagers in question enjoyed the concession of grazing their cattle in the reserves on payment of half the usual fees on the terms noted in the preceding paragraph. The extra terms imposed on them by the "Forest Village System" were that they should tend sandalwood and introduce timber species. Sandal is confined to one grazing block and covers an area of only 800 acres approximately. Mr. A. R. Brand, in his Working Plan paragraph 377, observed that the advantages derived from the system is not commensurate with the loss sustained in the shape of grazing fees. This has been dealt with by him in detail and final orders obtained from the Chief Conservator in his No. 4411/37-C-2, dated 16th December 1937, that this system will continue as it would be objectionable to withdraw a concession which has been enjoyed for over 15 years.

Grazing on payment of half the usual fees by the Malayalees of Attiyur and Arasampet Reserves of the Vellore Range.

417. *Terms of the concessions.*—These are that the Malayalees, in return for being allowed to graze their cattle at half rates, will—

(i) do all in their power to prevent fires and, if there is fire, they will take prompt steps to extinguish it ;

(ii) on no account damage by hacking or otherwise to sandalwood trees growing in reserves, unreserves and patta lands ;

(iii) not hack bamboos for the purpose of feeding cattle ;

(iv) not keep a larger number of goats than necessary for domestic purposes and will see that they do not browse in reserves ; and

(v) not permit ryots from the plains to pen cattle within their village limits unless they produce an order from the District Forest Officer permitting them to do so. In any case, they will report the arrival of such cattle as soon as possible to the Range Officer.

The concession may be withdrawn at once, if any of the above conditions are violated.

SECTION 5—SUBSIDIARY MEASURES FOR IMPROVEMENT.

418. *Closure of burnt areas.*—The prevalence of grazing is closely associated with deliberate setting of fire by graziers with the object of obtaining the tender grass which comes up in the first rain after the burn. The damage caused by fire has been dealt with elsewhere. It is possible to mitigate the harmful results by closing burnt areas to grazing. Under G.O. Ms. No. 51, Development, dated 4th January 1940, the District Forest Officer will issue orders for the closure of burnt areas to grazing for an adequate period if the area does not exceed 1,000 acres at a time, and will submit a report immediately to the Collector and the Chief Conservator of Forests.

419. *Improvement of watering facilities.*—It is desirable that the existing tanks and wells situated within the reserves, should be kept in a state of repair by the department. Most of the tanks carry water for a few weeks only after rains, while many of the wells run dry in the hot weather, when the need for watering facilities is most keenly felt. It is, therefore, prescribed that the existing tanks and wells situated within the reserves will be kept in proper repairs by the department. A list of such wells situated within the reserve is given below :—

Name of tank or well.	Name of reserve.	Remarks.
	Vellore Range.	
Goddukinar (well)	Arasampet.	
Vannankulam (tank)	Athiyur.	
Komattikulam (tank)	Nellimalai.	
Chinnakinar (well)	Arasampet.	
Chichappakulam (tank)	Do.	
Eesappanaicken (well)	Kylasagiri.	
Kanjipatam thoravi (well)	Athiyur.	

2. *Odugathur Range.*

Name of tank or well.	Name of reserve.	Remarks.
Solappanaickan (well)	Ambur.	
Karuthamalai (well)	Karuthamalai.	
Thandrevu (well)	Do.	
Kallaparai (well)	Ambur.	
Settikinar (well)	Do.	

3 . *Santavasal Range.*

Mullapadi (well)	*	
Sathampet (well)	†	
Thethikulam (tank)	Karnatigiri.	
Kilavankulam (tank)	Do.	

4. *Tiruvannamalai Range.*

Anaikuttai (small tank)	Ponniar.	
Elandaikuttai (small tank)	Do.	
Veppankuttai (small tank)	Do.	
Samaikuttai (small tank)	Perungolathur—Swamimalai.	
Servaneri (tank)	Ponniar.	
Ettikuttai (small tank)	Do.	
Kanavoikinar (well)	Perungolathur—Swamimalai.	
Annaperumankuttai (small tank) ..	Ponniar.	
Vellaikulam (tank)	Pavunjipettu.	
Vediyappankulam (tank)	Ponniar.	
Vetteri (tank)..	Do.	
Settikulam (tank)	Do.	
Vedipattikulam (tank)	Do.	
Kariyankinar (well)	Pavunjipettu.	
Puliyankuttai (small tank)	Perungolattur—Swamimalai.	
Ayambadi (well)	Do.	

* Near Kudikam. † In Amerdi Valley.

SECTION 6—CUTTING AND REMOVAL OF GRASS FROM RESERVED FORESTS.

420. *Cutting and removal of grass from reserved forests under the control of the Forest department.*—(i) Cutting and removal of grass in head loads are permitted from the reserved forests except in areas which are closed for silvicultural or other reasons. The removal of grass shall be allowed free only in head loads and for bona fide domestic use and not for sale. Removal in cart loads may be made only from areas in which it is specially allowed on payment of the prescribed fee.

(ii) No removal will be permissible from coupes under felling, in young plantations, in sandalwood propagation centres, areas closed to grass-cutting and other areas closed by the District Forest Officer for special reasons. Removals may be made throughout the year but they shall not be made before dawn or after dusk. No permits will be required. In case of contract, the lessee will be required to agree to free removal by the public in head loads.

(iii) The concession and the closed areas as well as the recognized footpaths or roads will be notified by the District Forest Officer annually in the District Gazette. Removals shall be made only through recognized footpaths or roads.

(iv) Long grass alone may be cut. It shall not be uprooted. Sickles shall be used. Bill hooks and felling axes shall not be carried. No forest produce shall be cut to stiffen or to tie the bundles.

(v) Head loads and cart loads should be presented for inspection when demanded by a Forest subordinate.

(vi) The grass shall not be set on fire either wilfully or negligently and no combustible material shall be taken into the forest ; if fire breaks out, the grass-cutters shall make every endeavour to extinguish it.

(vii) The concession is liable to be terminated for serious breach of any of the conditions mentioned above or in the event of the occurrence of any serious fire, under the orders of the District Forest Officer, who shall report the fact to the Collector for approval within ten days.

421. *Fodder supply from forest areas.*—In accordance with Recommendation IV of the Agricultural Commission (C.C.P. Mis. No. 439, dated 21st November 1928), the annual leases for the removal of hay by the military grass farms from the Banavaram reserve, the Chennur plantation, and any other locality where a demand may arise, will continue. Cutting and removal will be restricted to the period 1st July to 15th March each year and necessary precautions will be taken to protect buildings and forest growth from fire risk.

SECTION 7—OTHER REGULATIONS.

422. *Demarcation of closed areas.*—Areas closed to grazing will be indicated in the forest by means of a red band three inches broad painted across the coupe stones.

SECTION 8—ROTATIONAL GRAZING.

423. Rotational grazing was tried in the Mulakad Reserved Forest of Polur Range after obtaining the Government orders. When the scheme came into force, the villagers stoutly opposed it. The scheme had to be dropped consequently on obtaining the permission of the Chief Conservator of Forests in his Proceedings Rout. No. 462, dated 18th June 1940. The writer also consulted the villagers about the rotational grazing being introduced again and found that they are not in favour of it.

The closed coupes when thrown open will be on a rotational basis and this has been mentioned in the fuel working circle.

CHAPTER VIII—MISCELLANEOUS REGULATIONS.

SECTION 1—FIRE PROTECTION.

424. *General.*—The system of fire protection prescribed below is the same as that which has been in force during the currency of Mr. Brand's working plan.

425. *Prescriptions.*—The system prescribed falls under two heads, special and general. The former involves the allocation of definite areas to definite villages and the payment of rewards for successful protection: while in the latter, important roads, cart-tracks and footpaths will be fire traced as early as possible in the fire season and the local subordinates held generally responsible for protection. Details relating to special and general protection are given below :—

Special protection.

426. *Areas in which undertaken and their subdivision.*—The areas in which special protection will be undertaken and their subdivision for allocation to the several villages are set forth below :—

(i) *Santhavasal, Polur and Vellore Ranges.*—Eighty-eight thousand, five hundred and sixty-five acres, comprising the Javadi hill reserves and that part of the Thellali reserve which comes under the Forest Village System. The unit of protection will be the grazing block. A list of grazing blocks of which there are 152 is given in the statement in paragraph 414. The statement also gives the area of each block and the name of the village or villages, to which it is allotted.

(ii) *Tiruvannamalai Range.*—Eighteen thousand and nine hundred acres, comprising the Valasamalai, Natampalli and Perungolathur Swamimalai reserves on the Kalroyan Hills. Although the villages on these hills do not come under the Forest Village System, each village has been held responsible for protection within its own limits and has been paid rewards. This will continue and the unit of protection will, as hitherto, be the limits of the individual village. The names of the villages with their corresponding areas are given below :—

	ACS.		ACS.
	Valasamalai Reserve.		
Bimarapatti	1,300	Chinnavalasai	2,500
Gurukkalamanavur	300	Ulchekkadi	1,700
Melavalasai	1,800		
	Natampalli Reserve.		
Ulchekkadi	800	Pudduchekkadi	900
Attipadi	1,200	Kalnatur	500
Puliyampatti	1,300	Nerkunni	500
	Perungolathur Swamimalai Reserve.		
Navakkal	2,600	Kodiyanur	1,800
Puliankottai	1,200	Thoduthampaliyam	500

NOTE.—Areas are given to the nearest 100 acres.

427. *Fire lines.*—On the Javadi Hills, no fire lines are prescribed as fires are generally internal in origin. On the Kalroyans, however, there is always the risk of fires crossing over from the *Ponnankad* * cultivation which is common in the Jagir forests lying to the

* Dry cultivation in which timber species are raised with field crop.

south of the Valasamalai, Nattampalli and Perungolathur Swamimalai reserves. It is therefore prescribed that the following reserve boundary lines, constituting a part of the southern boundary of the division, be cleared and burned annually.

	Approximate length.
	MILES.
(i) The western and southern boundaries of the Valasamalai reserve, from just south of the Tettarai Odai stream in the north-west corner to the point where the southern boundary meets the south-west corner of the Nattampalli reserve.	10
(ii) The southern boundary of the Nattampalli reserve	$5\frac{1}{4}$
(iii) The southern boundary of Perungolathur Swamimalai reserve from the south-west corner to the point where it meets the western extremity of the Pavunjipettu reserve.	$1\frac{1}{4}$

The clearing and burning of these lines will be done by the villagers in return for the fire-reward paid to them.

428. *Fire rewards.*—It is prescribed that the rewards for the several units of protection, the areas of which have been given in paragraph 426 be calculated at the uniform rate of Re. 1 per 100 acres introduced by Mr. Brand and worked satisfactorily during the period of his working plan. The total area to be protected is 107,465 acres or say 107,500 acres.

The maximum amount of reward payable in any year will be Rs. 1,075 only.

429. *Fines for bad protection.*—It is prescribed that the West Vellore method of calculating, by the following formula, the fines to be imposed each year for bad protection be adopted. The formula was devised by the District Forest Officer, Khan Sahib Muhammad Habib-ul-lah Sahib Bahadur, and is based on the assumption that payment of rewards to any village is not justifiable if one quarter, or more, of the area of forest allotted to it is burned during the year.

Formula.

$$\text{Fine} = R - \frac{[A - (B \times 4)] \times R,}{A} \text{ where}$$

R = the maximum reward in rupees fixed for the village.

A = the area of forest in acres allotted to the village.

B = the number of acres in A which were burned during the year.

R and A are constants and it has been prescribed above that R shall be calculated at a rate of Re. 1 per 100 acres.

Example.—The area allotted to Bimarapatti village of the Tiruvannamalai Range is 1,300 acres. The maximum reward payable at Re. 1 per 100 acres is Rs. 13. It is assumed that 100 acres has been burnt during the year. The fine to be deducted from the maximum reward payable is thus :—

$$\text{Rs. } R - \frac{[A - (B \times 4)] \times R}{A}$$

$$\text{Rs. } 13 - \frac{[1{,}300 - (100 \times 4)] \times 13}{1{,}300}$$

$$\text{Rs. } 13 - \frac{[1{,}300 - 400] \times 13}{1{,}300}$$

$$\text{Rs. } 13 - \frac{900 \times 13}{1{,}300}$$

Rs. 13 — 9

Rs. 4

430. *Payment of rewards.*—There is occasional risk from fire in June, but after the end of June it may be taken that the forests are safe from fire. Burnt areas will have been inspected shortly after the occurrence of each fire and reports submitted from time to time during the fire season. It is important that as short a time as possible should lapse between

the close of the fire season and the disbursement of rewards for successful protection, so that the object of paying rewards and the reasons for imposing fines are still fresh in the minds of the villagers. Reward lists will therefore be submitted by Range Officers early in August; and, allowing for unforeseen delays and the time required for obtaining the Conservator's sanction, rewards will be disbursed early in October, that is, three months after the close of the fire season.

General protection.

431. *Areas in which undertaken.*—General protection will be undertaken in all areas where protection is not prescribed.

432. *Fire-tracing important roads, cart-tracks, and foot-paths.*—The following roads, cart-tracks and footpaths will be fire traced to a width of half a chain on either side. The work will be done as early as possible in the fire season. The cost will be about Rs. 2 per mile.

Name and description.	Approximate length.
	MILES.
Odugathur Range.	
Ambur-Asanampet Road from where it crosses the Aniamadukan Ar, one mile east of the Ambur rest-house to where it crosses the Tirtham Ar on the eastern boundary of the Ambur reserve.	10
Asanampet-Alangayam cart-track from where it enters the Ambur reserve as far as the district boundary.	1¼
Ambur-Naickaneri footpath for the distance it passes through the Ambur reserve.	3
Vellore Range.	
Sholavaram-Vellakal footpath for the distance it passes through the Attiyur reserve.	1¼
Attiyur-Karumalai footpath for the distance it passes through the Attiyur reserve.	1¼
Santhavasal Range.	
Karnatigur bridle path for the distance it passes through the Karnatigur reserve.	4

SECTION 2—EXPERIMENTS.

433. *Red sanders* (Pterocarpus santalinus) *increment plot.*—In paragraph 393 of Mr. Brand's working plan, it was proposed that a sample plot be laid out in the red sanders area in Chenur plantation to study the mean annual increment of the species.

Accordingly, a sample plot was laid out in the plantation and hundred red sanders trees representing twenty trees in each of the six-inch girth classes (12 to 18 inches, 18 to 24 inches, 24 to 30 inches, 30 to 36 inches and 36 to 42 inches) were selected and marked and their girth measurements recorded annually from 1938 till 1943. Copies of the measurements were also sent to the Provincial Silviculturist, Ootacamund, for record in his office. It was then decided that in view of the slow growth of red sanders, the measurement of trees in the experimental plot be recorded quinquennially (vide Salem Circle Conservator's No. 1268/43, dated 8th June 1943). The experiment will be continued.

SECTION 3—ROADS, BUILDINGS AND WELLS.

434. *Existing roads.*—All existing roads, a list of which has been given in paragraph 219 above, will be kept in a state of repair. The top section of the Chillimalai-Patrakad Ghat Road (item No. 29 on the list) has been realigned and constructed at a cost of Rs. 93,783 by the Forest Engineering Division and recently handed over to the division. The Patrakad-Chillimalai Ghat Road is the only outlet from the Javadi plateau eastwards to Polur and thence to outside markets by railway. Several cart-loads of bamboo will pass along the road annually and the prices realized for bamboo coupes depend to a very large extent on its condition. It is thus important that it should always be kept in a state of repair. The cart-track from Burgur to Arasampet (item No. 28 on the list) is another important extraction route for bamboos. It is being repaired by the bamboo coupe contractors from time to time. The existing practice may be continued.

435. *Proposed roads—Thanipadi-Ulchekkadi Road.*—In proposing the construction of this road Mr. Brand said "The construction of this road was originally considered in connexion with a resolution moved in the Legislative Council by Mr. M. B. Rangaswami Reddi, M.L.C., who was of opinion that the road would serve as an extraction route for sandalwood, teak and other valuable timber, which (he thought) were found in abundance

on the Valasamalai plateau in the Kalroyan Hills. Actually, sandal is limited to an area of some 800 acres around the Valasamalai enclosure and the annual yield from the locality will be only a few hundred weights. Teak and other timber species, although well represented, are not worth extracting (vide paragraphs 54 and 55 above). The road will, however, facilitate the extraction of bamboos from the Valasamalai and Natampalli felling series on either side of the Ulchekkadi valley. Extraction at present takes place along a very rough cart-track. The length of the alignment is nine miles and the estimated cost Rs. 3,850 of which Rs. 750 is required for the acquisition of the land. Of the nine miles, approximately five miles pass through patta lands, two and a half through poramboke and the remaining one and a half through the Chinniyampatti Panchayat reserve. A large number of villages would be served by the road and as it will chiefly benefit the public, its construction is proposed provided the district board is willing to contribute four-fifths of the cost, the remaining one-fifth or Rs. 770 to be met by the department."

For reasons not known, the road was not constructed during the currency of Mr. Brand's working plan.

In addition to the advantages enumerated by Mr. Brand justifying the construction of the road, the opening of fuel felling series on the Valasamalai and Nattampalli Reserved Forests in this working plan makes its construction necessary. It is, therefore, proposed that this road be constructed. Due to the high rates prevailing at present for the road works and the increased value of lands that will have to be acquired, it is expected that the road will cost Rs. 10,000 approximately for its construction.

436. *Metalling existing roads.*—The roads in Javadis were made at great expense to facilitate extraction of sandalwood, bamboos, fuel and minor forest produce and inspection by officers. It is therefore desirable that these roads are not only adequately maintained but also the more important of them improved by soling and metalling and made fit for traffic in all seasons. A beginning in this direction has already been made in Polur Range where the Forest Engineer has taken up soling and metalling of the Gillman road from where it enters the limits of the Vellore East Division up to the trijunction of the Gillman, Lushington and Komattiyur rest-house approach roads, and from this junction towards Patrakad in the Lushington road for a distance of four furlongs. The amount sanctioned for metalling four miles is Rs. 47,500. It is proposed that the work be continued to Patrakad and from Patrakad to Athimoor. The distance to be soled and metalled will be as follows :—

	M.	F.
Athimoor to Patrakad	11	7
Patrakad to Komattiyur	10	5
Total ..	22	4
Deduct distance already taken up for metalling by the Forest Engineer.	0	4
Balance to be metalled ...	22	0

The approximate cost of metalling this distance will be rupees two lakhs. The expenditure may be spread over the entire period of the working plan.

437. *Existing buildings.*—All existing buildings will be kept in a state of repair and their surroundings kept clear of under-growth as an anti-malarial measure (vide C.C.P.L. Dis. No. 615/29, dated 9th August 1929). Furniture in the rest-houses and inspection sheds should be kept serviceable always.

438. *Proposed buildings.*—The construction of the following buildings is proposed. They will be built, after consulting the Forest Engineer in accordance, with the approved type design of quarters for the respective subordinates. The site for construction will be

selected by the District Forest Officer. While it is not desirable to locate them in the midst of any conjested village, it is equally important that they should not be constructed in a lonely place where the subordinates cannot keep their family without fear.

Range.	Locality.	For whom intended.	Foresters' quarters.	Forest guards' quarters.	Watchers' quarters.
Santhavasal ..	Amerdi	Quarters for one forester, two forest guards and one watcher.	1	2	1
Do. ..	Athuvambadi ..	Quarters for one forest guard and watcher.	..	1	1
Polur	Athimoor ..	Quarters for two forest guards and one watcher.	..	2	1
Odugathur ..	Naickaneri ..	Quarters for one forest guard and one watcher.	..	1	1
			1	6	4

The approximate cost of the buildings will be as follows :—

	RS.
One forester's quarters	3,000
Six forest guards' quarters at Rs. 1,500 each	9,000
Four watchers' quarters at Rs. 1,000 each	4,000
	16,000

439. *Wells.*—Existing wells should be cleared annually and deepened and repaired as required from time to time. The pipe-line from the tube well at Mandaparai to the rest-house was dismantled because the capacity of the pump was not sufficient to lift the water to the rest-house. This rest-house is not one where officers camp very often. It is therefore enough if the surroundings of the tube well are kept free from growth and slush. But it should be insisted on the subordinates that water is pumped from the tube well and not drawn from the well which is close to it.

SECTION 4—MISCELLANEOUS REGULATIONS.

440. *Eradication of lantana.*—Lantana occurs in the following localities over an area of approximately 1,500 acres. It also occurs sporadically in other places.

Range.	Locality.	Area in acres.
Vellore	In and around Yerikollai enclosure in Arasampat Reserved Forest.	272
Odugathur	At the junction of the Vellakkal Pallam (stream) with the northern boundary of the Vellakkal reserve.	240
Santhavasal	In and around Periakottansetty enclosure in Arasampet Reserved Forest.	140
	In the Santhavasal fuel felling series	40
Polur	Along the district boundary about a mile east of the Gillman road.	60
	In and around Pelavadi enclosure near the western boundary of Patrakad Reserved Forest.	130
	In Iramayanur enclosure in Patrakad Reserved Forest ..	20
	In Chinthalur enclosure of Veerappanur Reserved Forest.	148
	In Thanjankollai enclosure of Veerappanur Reserved Forest.	10
	On either side of Selangu Ar (stream) about a mile south west of Pattankoil enclosure in the Patrakad reserve.	80
Tiruvannamalai ..	On the banks of the Ponniar river in the Ponniyar reserve.	360
	Total ..	1,500

The spread of lantana is not alarming.

Attempts in the past to eradicate lantana by cutting and uprooting have not been successful. The idea of eradicating it by spraying with sodium chlorate was dropped

since the solution was not available during the war period. Planting bamboo rhizomes underneath the lantana is said to have given good results in eradicating lantana in Salem north division. It is therefore prescribed that under planting with two year old bamboo rhizomes be adopted in this division also. The annual expenditure on this work should be limited to Rs. 200. The locality to be dealt with and the areas to be underplanted each year are left to the discretion of the District Forest Officer.

441. *Spraying* may however be adopted as an alternative provided the chemical available at pre-war rates and should, in the light of results obtained by adopting this method for a year or two, it be found cheaper in eradicating lantana than by underplanting of bamboos.

SECTION 5—EXPERIMENTAL PLANTATIONS OF SOFTWOOD SPECIES.

442. *Object of management.*—The object of management is to raise plantations of softwood in suitable localities to meet the overgrowing demand for softwood.

443. *Division of felling series.*—The total area now selected is 150 acres and is situated in two different ranges, thus forming two series of 75 acres each as shown in the fuel map (Blue band).—

Veerappanur series—Veerappanur Reserved Forest, Polur Range—75 acres.

Malayalam series—Malayalam Reserved Forest, Santhavasal Range—75 acres.

Every year five acres will be selected in each series and regenerated with suitable softwood species. If the scheme proves successful, the annual area may be increased by the District Forest Officer and additional suitable areas may be selected.

444. *Rotation.*—This is done purely on an experimental basis for the first time in this division. As such no definite rotation can be fixed. A rotation of 25 years is emperically fixed for *Melia dubia* and *Ailanthus excelsa.*

445. *Method of treatment—Demarcation.*—The annual coupe of five acros in each series will be demarcated by lines five feet wide on the ground to be cleared of all growth and be normally bound by not more than four straight lines. The coupes will be surveyed before the end of December preceding the year of regeneration.

446. *Clearing.*—All the trees and shrub growth except sandal will be clear felled and saleable materials may be disposed of by the District Forest Officer. The unsaleable material will be left on the ground. The fellings must be started sufficiently early to enable the cut materials to dry to give a good burn by the middle of April. As soon as the burn is over the soil must be raked up and the ash mixed with it. All these operations should be completed before the 15th of June of the year of regeneration and the ground should be ready for regeneration.

447. *Aligning and staking.*—The entire area must be aligned and staked with bamboo stakes one and a half feet high. This must be done during the month of September.

448. *Espacement.*—The espacement will be 9′ × 9′ as this is found suitable for fast growing species.

449. *Choice of species.*—The species to be raised are *Ailanthus excelsa* and *Melia dubia.*

450. *Planting.*—The method to be adopted will be entire transplanting. As this division gets only the benefit of the north-east monsoon, the transplanting will be done during October-November with the rains and preferably after one or two good showers have fallen. Planting must be done in prepared pits of one foot cube. The pits must all be on one side of the stake. The pits must be dug and dug earth filled in after a few weeks weathering. This must be done during the month of September soon after aligning and staking. The two species will be planted in alternate stakes as shown below :—

M <—9′<— A   M   A
↑
9′
↓
A   M   A   M

M   A   M   A

M = *Melia dubia.*

A = *Ailanthus excelsa*

451. *Weeding.*—The seedlings must be kept well weeded regularly as the young seedlings cannot stand weed competition. The weeding must be done for the first two years by which time the seedling will be well established.

452. *Protection.*—The entire area must be well fenced with useless cut materials to prevent cattle and wild animals from entering the area. The area must be well protected from fire by fire-tracing around the planted area.

453. *Nursery technique*—(*a*) Melia dubia.—Standard beds should be raised in good fertile soil, close to water facilities. As soon as the seeds of the species are collected they should be well pounded in a wooden mortar to remove the pulp. They should then be spread on the seed bed and covered with a three inch layer of dry leaf mould and burnt. Immediately after the burn, the seeds should be covered with a three to four inches thickness of earth and watered liberally. If found necessary a " pandal " may be put over the bed as a measure of conserving the moisture. Germination starts in two to three weeks. Sowing should be done in May and the resultant seedlings may be expected to be anything from nine inches to twelve inches by the end of September. If sufficient seeds are not available in the division the Provincial Silviculturist may be addressed to supply the seeds in time.

(*b*) *Ailanthus excelsa.*—Seeds should be sown in the month of September in raised beds, covered lightly with straw or grass and watered well if rains fall. The seeds should be soaked in cold water for a period of 24 hours before sowing, as this pre-treatment is found to give a higher percentage of germination. As one year old transplants give the best results the nursery should be raised one year in advance. The germination commences after a week or ten days and will be completed by the third week.

454. *General.*—The nursery should be well protected and kept free from weeds. Watering must be done liberally whenever there is no rain.

SECTION 6—EXISTING PLANTATIONS AT AMERDI AND TIRUVANNAMALAI.

455. *Amerdi timber plantation.*—The plantation is situated at Amerdi (Santavasal Range) on either banks of the Amerdi Ar and north of God Ar and forms part of Thellai Reserved Forest (original plantation included Malayalam Reserved Forest also). Amerdi is one of the most important valleys of the outer Javadi Hills, bounded on three sides by steep hills, and faced on the fourth side by Kalpat, etc., villages. The valley is reported to be as malarious as the Javadis plateau.

The history of the plantation prior to 1912, is practically unknown. In 1912, Mr. Hearsey made an attempt to replace the valueless species, with timber species, as he found that the whole area was sadly neglected and prickly-pear had overrun the whole space and was up to the verandah of the bungalow which was in disrepair. Thereafter from 1912–13 to 1920–21 timber species like teak, sisoo, rosewood, vengai, red sanders, mahogany and *Hardwickia binata* were planted over an area of about 80 acres. In 1942–43 and 1944–45, about 15 acres of the original plantation was taken up for planting casuarina. The present area of the plantation was taken up for planting casuarina. The present area of the plantation is about 65 acres containing the following species :—

Teak, rosewood, vengai, sisoo, red sanders, mahogany and *Hardwickia binata*. An enumeration of all the teak, rosewood and vengai trees was done by the Working Plan staff on 5th and 6th March 1948 and the results are tabulated as follows :—

Girth.	Teak.	Rosewood.	Vengai.
0—6″	..	..	..
7″—12″	25	7	..
13″—18″	77	41	..
19″—24″	310	91	..
25″—30″	378	76	..
31″—36″	277	31	..
37″—42″	96	11	..
43″—48″	31	10	1
49″—54″	6	..	..
55″—60″	1	..	..
61″—66″	1	..	1
Total ..	1,202	267	2

Climber cutting should be done at regular intervals at the discretion of the District Forest Officer.

456. *Amerdi casuarina plantation.*—As per Mr. Mitchell's scheme (sanctioned in Salem Circle Conservator's R.Dis. No. 2464/44-S, dated 8th October 1944) an area of about 40 acres was planted with casuarina on either side of Amerdi Ar (in Thellai and Malayalam Reserved Forests) in the years 1942–43 and 1944–45. These plantations appear to be successful though the cost of raising them has been prohibitive. The plantations should be watched till the end of the rotation (ten years).

457. *Amerdi* Melia dubia *plot.*—In front of the Amerdi rest-house in Malayalam Reserved Forest on the right bank of the Amerdi Ar, there is a natural plot of about 0·25 acre; stocked with *Melia dubia*. There is no record on hand, as regards the origin of this plot. Local enquiries reveal that, in 1945 when the area was clear-felled for planting up with casuarina, a big *Melia dubia* tree which existed there, was also removed. The area was burnt after clear-felling. After some time there was prolific regeneration of *Melia dubia* in that area (evidently from the seeds of the original tree) and they came up successfully. The District Forest Officer has done some thinnings and now the whole plot looks like an artificially raised plantation. The espacement varies from 6′ × 6′ to 8′ × 8′. An enumeration was done by the working plan staff on 5th February 1948 and breast height girths were taken. They are as follows :—

No.	Girth in inches.	No.	Girth in inches.	No.	Girth in inches.	No.	Girth in inches.
1	31	21	21	41	21	61	18
2	32	22	16	42	19	62	20
3	14	23	22	43	17	63	21
4	26	24	29	44	14	64	20
5	17	25	14	45	16	65	8
6	27	26	14	46	13	66	11
7	23	27	17	47	28	67	11
8	25	28	16	48	17	68	15
9	34	29	28	49	19	69	21
10	30	30	14	50	17	70	9
11	17	31	13	51	13	71	19
12	15	32	13	52	13	72	18
13	20	33	14	53	8	73	12
14	26	34	13	54	13	74	14
15	16	35	14	55	16	75	22
16	20	36	14	56	13	76	23
17	32	37	13	57	13	77	16
18	18	38	13	58	16	78	7
19	22	39	13	59	11	79	17
20	14	40	16	60	14	80	21
						81	22

There are 81 trees, and the average estimated height is 25 feet.

The plot is now four years old and it is worthwhile preserving this plot, and watching its growth. A thinning may be done by the District Forest Officer at a later stage, if found necessary. A record of all operations carried out may be maintained, as this interesting beginning of the plot, may lead to very useful conclusions, for the development of softwood in this division. This plot has been marked on the fuel map.

458. *Tiruvannamalai casuarina plantation.*—In Tiruvannamalai Range an area of about 48 acres, have been planted with casuarina in Ponniar East Fuel Felling Series from 1941 to 1945, as shown below :—

The plantations have been raised at a very high cost. At the end of the rotation when these plantations are clear-felled they should be regenerated with fast growing fuel species as prescribed for Palar Plantations in paragraph 312.

	ACS.		ACS.
In 1941	1	In 1944	15
1942	5	1945	20
1943	7		

SECTION 7—MALARIA.

459. *Malaria.*—Malaria is virulant on the Javadis ; as such the subordinates living there should be properly protected. They should be supplied with paludrine as it is found to be effective against malaria. They should also be supplied with D.D.T. for spraying their quarters. The Range Officers should see that the subordinates make use of D.D.T. daily. Simple rules as rolling down the sleeves, protecting the feet with stockings after dusk should be impressed on them.

SECTION 8—BOUNDARIES.

460. *Reserve boundaries.*—The clearing and maintenance of all reserve boundaries will be done by local subordinates and no extra expendituure should be incurred under this head except in certain localities where the lines are overgrown.

461. *Enclosure boundaries.*—The enclosure boundaries will be cleared by the subordinates with the help of the villagers free of cost. The protective staff should be vigilant on likely encroachers and whenever any encroachment does occur it should be severely dealt with.

SECTION 9—CONTROL.

462. *General.*—The correct and regular posting of control records and maps is most important and must receive the personal attention of the District Forest Officer. The control prescribed in the following paragraphs will be maintained as laid down for each working circle separately or for the working plan area as a whole. The forms to be used are given in Appendix VIII. Since the control records were maintained in the prescribed form by the District Forest Officer during the currency of Mr. Brand's Working Plan and as the same forms are prescribed to be followed, for this plan also, without any change, no sample entries are given now. The District Forest Officer will have the forms printed according to the requirements.

463. *Sandal Working Circle*—(i) *Control of fellings—Form VIII.*—A separate form will be used for each felling series and also for the enclosures situated in each range. The District Forest Officer will write up the columns and if there is a deviation, quote the authority in column (5) when sanction is received.

(ii) *Record of yield—Form VIII (a)* *.—All columns will be writen up by the District Forest Officer.

(iii) *Felling Series Journal—Form IX.*—All columns will be written up by the District Forest Officer. A separate form will be used for each felling series or the enclosures of each range.

(iv) *Control for sandal propagation plots—Form IX (a).*—A separate form will be maintained for sandal propagation plots.

(v) As enumeration and tending automatically precede extraction it will suffice if these items are recorded in the Record of Works. [Paragraph 469 (i) below].

464. *Fuel and Small Timber Working Circle*—(i) *Control of fellings—Form XI.*—A separate form will be used for each felling series. The District Forest Officer will write up the columns as each coupe is worked and will record in column (6) the reason for any area remaining unworked and deviations, if any, quoting the authority in each case.

(ii) *Record of yield—*Form XI(a).*—The form merely records yield from areas actually worked. A separate form will be used for each felling series. Columns (2) and (3) will show such areas and the whole form will be filled in by the District Forest Officer. Deviations are dealt with in Form XI and will not appear in column (5) of this form. In order to complete the form every contractor shall be required to furnish by the 15th of each month a statement showing the number of stacks of firewood (the dimensions of which will have been fixed by the District Forest Officer—vide paragraph 310 (ii) and the number of cubic feet of small timber removed from his coupe in the previous month.

(iii) *Control of concentrated Kumri regeneration—Form XII.*—A journal for each range sould be maintained in the form given in Appendix VIII.

* This form is not strictly a control form as no outturn check is prescribed. But it is necessary to record an abstract of yields and desirable to compare it with the working plan estimate. To record the yield in the control form would make it too cumbersome.

(iv) *Control of Palar Casuarina Plantation Fuel Felling Series—Form XII (a).*—When casuarina plantations are clear-felled and regenerated with fuel species, all the details of work done should be recorded in a separate form given in Appendix VIII.

(v) *Recording worked areas on fuel working maps.*—The coupes, or parts thereof, felled each year will be recorded on the fuel working maps in the red water-proof ink by parallel horizontal lines about 1/16th of an inch apart. This will be done on both the range and district maps. The area in acres need not be marked in as this would overcrowd the map with unnecessary details, but the year of working must be written.

465. *Bamboo Working Circle*—(i) *Control of fellings—Form XIII.*—A separate form will be used for each felling series. The District Forest Officer will write the columns as each coupe is worked and if there is a deviation, quote the authority in column (5) when sanction is received.

(ii) *Record of yield—Form XIII (a)* *.—The form merely records yields from areas actually worked. A separate form will be used for each felling series. Columns (2) and (3) will show the areas worked and the whole form will be filled in by the District Forest Officer. Deviations are dealt with in Form XIII and will not appear in column (5) of this form. In order to complete the form every contractor shall be required to furnish by the 15th of each month a statement showing the quantities of bamboo, *Bambusa arundinacea* and *Dendrocalamus strictus* separately, removed by him in the previous month. The denominations of quantities, i.e., cart-loads, head-loads or culms should be clearly recorded.

466. *Minor Forest Produce Working Circle*—(i) *Control of working—Form XIV.*—The District Forest Officer will write up all the columns, and if there is a deviation quote the authority in column (4) when sanction is received. A separate form need not be used for each year ; sufficient space should be left against each sale unit in the forms for use during the whole working plan period. When any particular product for which a special demand may have arisen is singled out and sold separately a brief note should be recorded in column (4).

(ii) *Record of yield—Form XIV (a)**.—The form merely records the quantities of the various products collected in each range every year. Products have been grouped together under maunds, measures, cart-loads and pounds. This is in accordance with the custom prevailing in the local markets. The District Forest Officer will write up all the columns each year. Every contractor shall be required to furnish by the 15th of each month, a statement showing the quantity of each product removed by him in the previous month.

467. *Green Leaf Manure Working Circle *—Record of yield—Form XV (a)* *.—The form merely records the number of cart-loads of green leaves removed annually from each range. The District Forest Officer will write up all columns each year.

468. *Grazing Working Circle—Control of grazing—Form XVI.*—The two prescriptions which require control are, closure of certain areas and the continuance of concessions. These are provided for in control Form XVI. The whole form will be written up by the District Forest Officer every year. Deviations, if any, with authority, should be recorded in column (6).

469. *The Whole Working Plan Area.*—(i) *Record of works* will be maintained in one loose leaf file. Separate sheets will be allotted for each year and for each working circle and for miscellaneous, but not for each felling series. It will not repeat information already given in the foregoing control forms. " Measures prescribed ", " suggested " and " done but not prescribed or suggested " will each have a sheet of its own under each working circle and miscellaneous. The form to be used is given in Appendix VIII. The District Forest Officer will write all the columns.

(ii) *Control Journal* will also be maintained in a loose leaf file, and will give a detailed account of the operations of the working plan. The journal is intended to give the District Forest Officer an opportunity for recording suggestions for modification and improvement in the methods of working which have been prescribed ; and if properly maintained should be of great help at the next revision of the working plan. Separate pages will be allotted for each working circle, Miscellaneous, Establishment and Labour, and Financial Results. Notes should be brief and of interest ; needless and useless remarks should be avoided. The headings noted in Appendix VIII are suggested as a guide.

---

* This form is not strictly a control form as no outturn check is prescribed. But it is necessary to record an abstract of yields and desirable to compare it with the working plan estimate. To record the yield in the control form would make it too cumbersome.

(iii) *Deviation statement* will be written up in the form prescribed in Appendix VIII and maintained in a separate loose leaf register, a spare copy of the deviation statement will accompany the control returns sent by District Forest Officer through the Territorial Conservator to the Working Plan Conservator. The Territorial Conservator will record any remarks he has to make on the deviation statement and the Working Plans Conservator will submit the statement with his remarks and recommendations to the Chief Conservator of Forests, who will communicate copies of his orders on it to all three officers.

On receipt of Chief Conservator's orders, the District Forest Officer will quote Chief Conservator's order in the remarks column of control form against deviation items hitherto pending sanction.

Only serious deviations need the Chief Conservator's prior sanction. Minor ones will have already been sanctioned by Conservator, or will be sanctioned on the deviation statement. A good deal of correspondence will thus be avoided.

(iv) *Fire map.*—A fire map for the whole district on a scale of 1 inch to a mile will be maintained in the District Forest office separately for each range. Burnt areas will be marked in as soon as fire occurrence reports are received from Range Officers, a different symbol or colour being used for each year.

CHAPTER IX—ESTABLISHMENT AND LABOUR.

SECTION 1—ESTABLISHMENT.

470. *Additional establishment required.*—As the present establishment is able to cope up with the work satisfactorily, no additional establishment is proposed.

SECTION 2—LABOUR.

471. Every endeavour should be made to see that the forest village system on the Javadi hills works satisfactorily. Prompt payment of fire-rewards and wages for works done will go a long way towards securing this.

CHAPTER X—FINANCIAL FORECAST AND COST OF THE WORKING PLAN.

472. *Financial forecast.*—Statements are given below showing the estimated revenue and expenditure for the period of this working plan. Revenue from sale of sandalwood contributes 32 per cent of the total revenue of the division. This item, however, is subject to the fluctuations in the quantities of sandalwood and the prices obtained at the annual sales. The revenue from bamboo is the next item in point of importance in the division and it represents about 24 per cent of the total revenue.

The estimate for revenue and expenditure is based mostly on the average of the last eleven years. Reserve fuel felling series, however, have not been taken into account in framing the estimate for fuel.

Statement of Revenue and Expenditure for the fifteen-year period from 1949–50 *to* 1963–64.

REVENUE.					EXPENDITURE.			
Working circle or area. (1)	*By the sale of* (2)	*Rate.* (3)	*Amount.* (4)	*Paragraph references and remarks.* (5)	*Particulars.* (1)	*Rate.* (2)	*Amount.* (3)	*Paragraph references and remarks.* (4)
		RS.	RS.			RS. A. P.	RS.	
Sandal Working Circle.	Working 720 tons sandal wood.	1,300 per ton.	9,36,000	*Paragraph* 253.—Calculation of the yield. The average rate for the twelve years from 1935–36 to 1946–47 is Rs. 1,284 or Rs. 1,300. The average for the last three years is Rs. 3,021 but this represents the period when prices were very high due to the effects of war. Hence the average rate for the twelve-year period is adopted.	Conservancy and works—Reclearing 317.7 miles of coupe boundary.	3 0 0 per mile.	953	*Paragraph* 255—*Expenditure for fifteen years.*—The rates are those that existed in normal years. Rates given in paragraph 109 bear an increase in 75 to 150 per cent over the normal rates. These enhanced rates will be reduced to normal rates when the economic conditions become normal.
					Marking and enumerating dead sandal trees for extraction over 132,384 acres. Extraction, rough cleaning and transport to the sale depot at Tiruppattur including reweighing and final clearing.	0 0 3	2,069	
					Vellore Range—6·03 tons ..	70 0 0 per ton.	441	
					Santavasal Range—286·2 tons ..	60 0 0 per ton.	17,172	
					Polur Range—423·3 tons ..	45 0 0 per ton.	19,049	
					Tiruvannamalai Range—1·1 ton.	80 0 0 per ton.	88	
Fuel and Small Timber Working Circle.	35,010 acres in 38 felling series.	24 0 0 per acre.	8,40,240	Sum of areas in columns for fifteen years (statement in paragraph 297). The average rate for the last twelve years working is Rs. 23–10–0 or Rs. 24.	Providing and erecting coupe stones with number of coupe and year of felling engraved on each. It is anticipated that about 1,300 stones will be required for 570 coupes.	3 0 0	3,900	Normal rates.
Bamboo Working Circle.	189,770 acres in 34 felling series worked on a three years' rotation.	..	7,62,600	The estimate is based on the average annual revenue realized during the eleven years from 1935–36 to 1945–46, i.e., Rupees 50,840 × 15 = 7,62,600—Paragraph 226.	Nil	..	..	....
Minor Forest Produce Working Circle and Green Leaf Manure Working Circle.	Minor forest produce throughout the division and green leaf for manure from 18 series aggregating 44,407 acres.	..	3,30,000	*Paragraph* 226.—The average revenue for the period from 1935–36 to 1945–46 is Rs. 21,065. The present estimate is calculated at Rs. 22,000 per year owing to the increase in revenue anticipated due to the addition of 9,524 acres in Vellimalai and Alaiyalamangalam farm and 4,701 acres in Green Leaf Manure Working Circle.	Nil	..	..	....
Grazing Working Circle.	Grazing permits ..	..	2,52,450	*Paragraph* 226.—This is calculated at the average of revenue for eight years from 1938–39 to 1945–46. The figures of 1935–36 to 1937–38 were ignored as the grazing fees were halved from 1938 onwards.	Improvements of watering facilities.	..	5,635	Average for the past eleven years multiplied by 15, i.e., Rs. 375–12–0 × 15 = Rs. 5,635.

The whole division.	Miscellaneous items, timber and fuel from unreserves, fines, forfeitures, land leases, etc.	..	3,16,560	This is also based on the average revenue for the past eleven years.
	Total Revenue ..		34,37,850	

Fire protection—			
Payment of fire rewards	..	16,125	....
Fire tracing 330 miles of important roads, cart-tracks and foot-paths.	2 0 0	660	....
Experiments—Maintenance of red sanders plot at Senur.	..	7,500	A sum of Rs. 500 for various experiments, column (5) of statement at paragraph 219.
Forty sample plots in sandal areas raising green leaf plantation and soft wood plantation.	..		
Communication and buildings—			
Maintenance of existing roads.	..	97,500	Average cost of maintenance Rs. 6,427 or 6,500.
Maintenance of buildings ..		36,195	*Paragraph* 220.—Average annual maintenance Rs. 2,413 × 15 Rs. 3,6195.
Maintenance of wells	..	2,700	The average annual expenditure is Rs. 179–8–0 or Rs. 180. Hence for fifteen years the amount will be Rs. 180 × 15= Rs. 2,700.
Construction of new roads	..	..	Paragraph 221.
Tanipadi-Ulchakkadi road—Nine miles—metalling existing roads.	Lump sum.	10,000	Paragraph 435.
Solving and metalling road from Athimoor to Komattiyur, 22 miles.	Do.	2,00,000	Paragraph 436.
Construction of new buildings—			
Quarters for one Forester ..	..	3,000	Paragraph 438.
Quarters for six Forest Guards.	..	9,000	Paragraph 438.
Quarters for four watchers.	..	4,000	Paragraph 438.
Eradication of lantana ..	200 to be spent for every year.	3,000	Paragraph 440
Establishment—			
Existing strength	..	10,56,285	Average for eleven years from 1935-36 to 1945-46 multiplied by 15.
Miscellaneous items—			
Repairs and renewals of stores tools, etc., honoraria and contingencies excluding pay of menials.	..	1,71,360	*Paragraph* 226.—Average of eleven years multiplied by fifteen years.
Total Expenditure ..		16,66,632	

	RS.
Estimated revenue for fifteen-year period 1949–50 to 1963–64	34,37,850
Estimated expenditure for fifteen-year period 1949–50 to 1963–64	16,66,632
Estimated profit for fifteen-year period 1949–50 to 1963–64	17,71,218
Estimated annual profit	1,18,081

or Rs. 242–15–6 per square mile of reserved forest.

or Rs. 0–6–0 per acre.

473. *Cost of the Working Plan.*—The cost of the Working Plan is Rs. 22,262 This works up to Re. 0–0–2 per acre. The details relating to the cost of the Working lan is given below :—

Particulars.	Amount.
	RS.
Pay of officers—voted	5,491
Pay of establishment	6,726
Dearness allowance	3,715
House rent	517
Travelling allowance	3,897
Fixed travelling allowance	381
Other compensatory allowances	100
Contingencies	538
Field work	897
Total ...	22,262

N. RAMAKRISHNAN,
Working Plan Officer, Vellore East Division.

S. R. RAO,
Conservator of Forests, Working Plans Circle, Ootacamund.

SUMMARY OF PRESCRIPTIONS.

		Number of paragraph in working plan.
	Sandal Working Circle.	
1	*Sylvicultural system.*—A modification of the selection system consisting of the removal of dead trees only and of the maintenance and improvement of the growing stock by rigid protection and tending operations	247, 248
2	*Felling series.*—Nine	249, 250
3	*Felling cycle.*—Six years	251
4	*Allocation of coupes.*—Each felling series divided into six coupes ; positions snown on Sandal Working Map	252
5	*Yield.*—Santavasal Range .. .. .. 19·08 TONS. Polur Range .. .. 28·22 Vellore Range .. .. 0·42 Tiruvannamalai Range .. .. 0·07 47·79 or 48 tons.	253
6	*Regulation of operations.*—One coupe in each felling series and a definite area of Sandal bearing enclosures to be exploited annually	254
7	*Clearing and reclearing after the first felling cycle, coupe boundaries.*—Lines 10 feet wide to be cleared where coupe boundaries do not correspond with natural or permanent artificial features. Clearing and reclearing to be done in the year preceding felling	255
8	*Exploitation.*—Extraction confined to dead trees, both standing and fallen, including all stumps and roots. All green fallen or broken stems and branches also to be removed	256
9	*Minimum exploitable size.*—Trees containing no heartwood not to be despatched to sale depots and no root containing heartwood of more than the size of half a rupee to be left on the ground	257
10	*Restriction of output.*—None imposed as exploitation is to be regulated by area.	258
11	Size of coupe .. .. } Vide tabular statement of felling	259, 260
12	Area of enclosure to be exploited annually .. .. }	
13	*Tending.*—No general tending prescribed. Creepers to be cut during marking for extraction	261
14	*Artificial regeneration.*—Each year one plot of one acre will be taken up in each of Tiruvannamalai and Santavasal ranges	262 to 280

Number of paragraph in working plan.

Sandal Working Circle—cont.

15 *Fire protection.*—Included in that of the division as a whole. In addition flowered bamboo areas, if in the opinion of the District Forest Officer, susceptible to danger from fire, should be demarcated by a 30 feet cleared line and should be kept cleared of combustible material during the hot weather .. 281, 282

16 *Measures for the prevention of the spread of spike disease.*—As the spike control has not produced any beneficial result, it is given up at present. Immediately a spike tree is detected it should be extracted 283

17 *Retail sales.*—Billets 6 to 12 inches in girth and 6 to 12 inches in length and limited to 5 lb. each in weight to be distributed among Range Officers as follows :—

Vellore .. .. 200 billets.

Tiruvannamalai .. .. .. 250 ,,

Minimum stock with any Range Officer, 25 billets .. .. 284 to 287

Fuel and Small Timber Working Circle.

1 *Sylvicultural system.*—Simple coppice with the reservation of sandal, minor forest produce and bark yielding trees 290

2 *Felling Series.*—Forty, Thirty-eight " Regular " and two " Reserve " .. 291

3 *Rotation.*—Thirty-five years 292

4 *Size and allocation of coupes.*—Coupes have been allocated for the whole rotation—position marked on fuel maps .. .. 293 to 296

5 *Calculation of yield.*—Based on actuals of last 11 years working 297

6 *Regulation of operations.*—One coupe in each of the 'Regular' felling series only. The fuel working maps show the sequence of working 298

7 *Method of executing fellings.*—One coupe each year 299

8 *Laying out and demarcation of coupes.*—Coupes to be surveyed and demarcated by lines 6 feet wide by end of November in the year preceding felling where natural boundaries are absent 300

9 *Cost of demarcation.*—Fuel resulting from clearing coupe lines to be handed over to the contractor, who purchases the coupe, after recovering the cost of clearing from him 301

10 *Agency of felling.*—By contractors only 302

11 *Period of lease.*—1st August to 31st January of the following year for cutting manure leaf, 1st April to end of February for felling and 1st April to 31st March for removals 303

12 *Coupe arrears.*—Arrear coupe will be surveyed and computed. District Forest Officer will endeavour to get the contractor of the current year to purchase the unworked portion. If in any case it is unworked, reasons should be recorded in the control book 304

13 *Division of coupes into strips and control of fellings.*—Immediately after sale, coupes to be divided into a convenient number of strips, 20 to 25 acres in extent, by natural features of cleared lines 6 feet wide. Felling to proceed strip by strip 305

14 *Green leaf manure.*—Coupes to be sold eight months in advance of the year of felling and contractor to cut and remove till 31st January of the following year 306

15 *Cutting thorny growth at time of felling.*—Contractor not to cut thorny growth not saleable 307

16 *Useless tree species.*—Need not cut if unsaleable 308

17 *Felling rules.*—Five rules prescribed 309

18 *Disposal of felled material.*—Small timber to be hammer-marked by the coupe forest guard and fuel to be stacked before removal. Size of stacks to be fixed by the District Forest Officer in consultation with contractors. Cutting and removal of twigs and thorns by purchasers and consumers under head-load chits issued by contractors not to be permitted 310

19 *Artificial regeneration.*—The five Palar river casuarina plantations with river accretions to be regenerated with fast growing fuel species 312

20 *Sylvicultural system.*—Clear felling and regenerating with *Prosopis* and *Pithocolobium dulce* 313

21 *Rotation.*—None fixed now 314

22 *Preparation of the ground.*—After clear-felling, the area should be burnt in May and June 315

		Number of paragraph in working plan.
	Fuel and Small Timber Working Circle—cont.	
23	*Choice of species.*—*Prosopis* and *Inga* (*Pithocolobium dulce*)	
24	*Method.*—Planting nursery seedlings of these species raised in pots open at both ends—to be put out early with the south-west monsoon	
25	*Espacement.*—12 feet × 12 feet—species to alternate	316
26	*Nursery.*—Site should be near planting area—effective fence need—watering essential—shelter from wind—overhead shadow to be avoided	
27	*Planting.*—Pitting to be done simultaneously with planting with the south-west monsoon	
28	*Inga dulce* seeds will be sown in prepared soil	319
29	*Concentrated 'Kumri' regeneration.*—To be undertaken only if kumridars are forthcoming	318
30	*Object.*—Three objects given	317
31	*Area kumried and extent of area available.*—Marked on separate maps	320
32	*Method of regeneration.*—To be combined with 'Kumri'	321
33	*General details of the work.*—Area to be handed over to Kumridar should not exceed 5 acres—Permits to be issued under section 21 of Madras Forest Act—Area to be handed over to Kumridar in December	322 to 325
34	*Soil working and layout.*—To be undertaken towards end of April—Strips 4 feet broad and 26 feet apart from edge to edge	326
35	*Bunding.*—To prevent erosion during thunder storm	327
36	*Seed collection.*—To be collected by subordinates free of cost	328
37	*Sowing.*—In June-July	329
38	*Field crops.*—Approved crop to be raised	330
39	*Forest crops.*—List given	331
40	*Soil working.*—To be done thrice in the first growing season	332
41	*Later tending.*—If kumridar is allowed to continue for four or five years, the cost of later tending can be eliminated	333
42	*Climber and creeper cutting.*—No necessity if the initial burn is efficient ..	334
43	*Supply of small timber to ryots for the manufacture of agricultural implements.*—Provision to be made by contractors—suitable clause to be inserted in coupe agreements	335
44	*Disposal of palmyra palms.*—May be removed as fuel if they fall within fuel series. If not to be sold standing by the District Forest Officer after fixing the seigniorage and obtaining the previous sanction of the Conservator ..	336
45	*Indicator areas.*—Not prescribed	337
46	*Closure to grazing.*—Four years including the year of felling. Grass cutting in particular areas may be permitted with the specific sanction of the Conservator, When coupes are thrown open for grazing it should be done on rotational basis	338, 339
47	*Coupe stone.*—One to be planted at each of the four salient corners of a coupe. Number of coupe and year of felling to be engraved on each stone	340
	Bamboo Working Circle.	
1	*Felling cycle.*—Three years	347
2	*The intensity of felling in a clump.*—Current years culms not to be felled and a minimum of four mature culms to be left in each clump	348
3	*The height at which culms should be felled.*—Two to three feet from ground ..	349
4	*Felling rules.*—Four prescribed	350
5	*Calculation of the yield.*—Since bamboos have flowered gregariously, no forecast could be given	351
6	*Subdivision of the area.*—Thirty-four felling series of three coupes each	352
7	*Regulation of fellings.*—Through contractors, one coupe in each felling series to be worked annually	353
8	*Period of lease.*—Annual leases to be adopted	354
9	*Hacking of* dendrocalamus strictus.—Severe punitive action to be taken against the Malayalees by cancelling either whole or in part, the concession of free grazing in blocks where damage is bad. It is also suggested that graziers be prohibited from carrying bill hooks	356
10	*Overworking by contractors.*—Imposition of heavy fines suggested	357

Number of paragraph in working plan.

Bamboo Working Circle—cont.

11 *The construction of new roads and extraction cart-tracks.*—Chinnayampatti to Ulchekkadi road proposed. Contractor to get the approval of the District Forest Officer before making a new cart-track. Range officers to align suitable traces, if necessary 358, 359

12 *Grazing.*—No restriction imposed 360

13 *Fire-protection.*—Included in the general scheme of protection for the division—See miscellaneous regulations 361, 362

Minor Forest Produce Working Circle.

1 *Subdivision of the area.*—Collection of barks and nux-vomica by ranges, quarries to be leased separately or in groups and other produce by farms. Nineteen farms prescribed. Banavaram reserve and the Palar river plantations to constitute separate sale units 364, 365

2 *Konnai* (Cassia fistula) *bark.*—To be worked on a five-year rotation. Lease period limited to one year from 1st July in the year of sale 366

3 *Avaram* (cassia auriculata) *bark.*—To be worked on a three-year rotation. To be sold in auction in June. Lease period limited to one year from 1st July to 30th June of the following year 367

4 *Sural* (Ventilago *spp.*) *bark.*—To be sold in June each year. Lease period limited to one year from 1st July to 30th June of following year 368

5 *Quarries.*—To be leased separately or two or more together. Lease period left to the District Forest Officer but not to exceed three years. Lease to begin on 1st July in year of sale 369

6 *Other produce.*—To be leased annually. Lease period 1st July in year of sale to 30th June following. Farms to be sold separately or two or more clubbed together. Products having a special demand may be sold separately. Nux-vomica included except in Tiruvannamalai range 370

7 *Departmental working.*—May be resorted to when necessary or expedient with the prior sanction of the Conservator 371

8 *Malayalee labour.*—Contractors to pay a reasonable price to the Malayalees for the produce collected from the patta. (A clause to the effect to be added in the agreement) 372

9 *Improvement of minor forest produce.*—Artificial regeneration to improve the minor forest produce species 373

10 *Selection of area.*—Five acres annually 374

11 *Demarcation.*—To be surveyed and demarcated by lines 5 feet wide by the end of September preceding the year of regeneration 375

12 *Selection of Kumridars.*—Landless Malayalees of Mandaparai or adjacent villages to be selected 376

13 *Issue of permits under section 21, Madras Forest Act.*—Necessary safeguards to be taken from lands being claimed for patta 377, 378

14 *Clearing.*—Clearing and burning should be completed by the 15th April .. 379

15 *Layout.*—Pits one foot cube 30 feet apart 380

16 *Choice of species and sowing.*—*Terminalia chebula* to be shown in prepared pits in September 381

17 *Weeding and soil working.*—Seedlings to be kept free of weeds. Soil working in September and February 382

18 *Watering.*—One gallon once in a week for each pit during break in rains 383

19 *General.*—Work should be done departmentally if Kumridars are not forthcoming 384

Green Leaf Manure Working Circle.

1 *Constitution.*—Working circle composed of 18 series aggregating 44,407 acres—coupes worked on a three-year cycle 388

2 *System.*—Departmental permits will be issued at Re. 1 per cart-load and one anna per head-load for removals of green leaf manure in Santavasal, Polur and Tiruvannamalai ranges and at Re. 0-12-0 per cart-load and nine pies per head-load for removals in Vellore and Odugathur ranges 389

3 *Rules regulating cutting and removal.*—Five rules prescribed 390

4 *Artificial regeneration of manure leaf species—Object.*—To regenerate manure leaf species by 'Kumri' method 391

5 *Division of felling series.*—Two series Vellakal and Aliamangalam of 200 acres each. Every year 5 acres in each series will be regenerated 392

	Number of paragraph in working plan.
Green Leaf Manure Working Circle—cont.	
6 *Period of cultivation.*—Limited to five years	393,394
7 *Felling cycle.*—Three-year felling cycle to be adopted after the fifth year	395
8 *Kumridars required.*—Not more than $2\frac{1}{2}$ acres to each kumridar. If kumridars are not forthcoming, work to be done departmentally	396
9 *Method of treatment—Demarcation.*—Coupes to be surveyed and demarcated by lines 10 feet wide, by the end of September	397
10 *Selection of kumridars.*—To be selected from landless poor	398
11 *Issue of permits* under section 21 of Madras Forest Act	399, 400
12 *Sowing.*—Fast growing species to be sown in June-July	401
13 *Soil working.*—Thrice a year	402
14 *Grazing.*—Closed to grazing from the year of formation. Removal of fodder grass permitted	403
15 *Protection.*—Area to be protected from fire	404
16 *Financial forecast.*—None given	405
Grazing Working Circle.	
1 *Constitution.*—All reserves excluding Banavaram and the Palar river plantation.	406
2 *Prescriptions.*—Grazing year, 1st July to 30th June. Goat browsing to be prohibited and worked coupes to be closed to grazing for four years including the year of felling	409
3 *Area where no grazing concessions exist.*—Grazing under permits subject to usual condition and at rates sanctioned by Government from time to time—Permits valid for one season and to be issued by officer not below the rank of Forester	410, 411
4 *Grazing concessions.*—(i) Free grazing under 'Forest Village System' by Malayalees of the Javadi hills in the Santavasal and Polur Ranges and of that part of the Thellai reserve situated in the Vellore (old Odugathur) Range	412, 413
5 *Grazing blocks under the 'Forest Village System'.*—152 prescribed	414
6 *Refund of grazing fees under the 'Forest Village System'.*—To be made early in October each year	415
7 *Thellai reserve.*—Forest Village System to continue	416, 417
8 *Closure of burnt areas.*—Burnt area up to 1,000 acres to be closed by the District Forest Officer and report to be sent to the Collector and Chief Conservator	418
9 *Improvement of watering facilities.*—Existing tanks and wells to be kept in proper repair	419
10 *Cutting and removal of grass from reserved forests.*—Cutting and removal of grass from reserved forests for bona fide domestic use is permitted under specific conditions	420
11 *Recommendation No. IV of the Agricultural Commission—Fodder supply from forest areas.*—Annual leases, for the removal of hay by the Military Grass Farms to be continued. Period of lease, 1st July to 15th March	421
12 *Demarcation of closed areas.*—Red band, 3 inches broad, painted across coupe stones to indicate closed coupes	422
13 *Rotational grazing.*—Closed coupes when thrown open will be on a rotational basis	423
Miscellaneous Regulations.	
1 *Fire protection.*—Special protection to be undertaken in 88,565 acres in the Santavasal, Polur and Vellore ranges and in 18,900 acres in the Tiruvannamalai range	426
2 *Fire lines.*—$16\frac{1}{2}$ miles of reserve boundary on the Kalroyan hills to be maintained as fire lines	427
3 *Fire rewards.*—Rates fixed at Re. 1 per 100 acres	428
4 *Fines for bad protection.*—To be worked out by special formula and the balance payable disbursed early in October	429
5 *Payment of rewards.*—Rewards to be paid early in October	430
6 *General protection.*—To be undertaken in all areas where special protection is not carried out	431
7 *Fire tracing important roads, cart-tracks and foot-paths.*—$21\frac{3}{4}$ miles to be fire-traced at Rs. 2 per mile	432

	Number of paragraph in working plan.
Miscellaneous Regulations—cont.	
8 *Red sanders* (Pterocarpus santalinus) *increment plot.*—Measurement to be recorded once in five years	433
9 *Existing roads.*—To be maintained	434
10 *Proposed roads.*—Tanipadi-Ulchekkadi road—Rs. 10,000	435
11 *Metalling existing roads.*—Komattiyur to Athimoor road, via Patrakad—Rs. 2 lakhs	436
12 *Existing buildings.*—To be maintained	437
13 *Proposed buildings.*	438

			RS.
(i)	Quarters for	1 forester at Amerdi, Santavasal range	3,000
(ii)	Do.	2 forest guards at Amerdi, Santavasal range ..	3,000
(iii)	Do.	1 watcher at Amerdi, Santavasal range	1,000
(iv)	Do.	1 forest guard at Athuvambadi, Santavasal range ..	1,500
(v)	Do.	1 watcher at Athuvambadi, Santavasal range ..	1,000
(vi)	Do.	2 forest guards at Athimoor–Polur range	3,000
(vii)	Do.	1 watcher at Athimoor-Polur range	1,000
(viii)	Do.	1 forest guard at Naickaneri, Odugathur range ..	1,500
(ix)	Do.	1 watcher at Naickaneri, Odugathur range	1,000

14 *Wells.*—To be maintained properly	439
15 *Eradication of lantana.*—Total area 1,500 acres—Under-planting with bamboo rhyzomes prescribed	440
16 *Spraying.*—May be adopted as an alternative method provided the chemical is available at pre-war rates	441
17 *Experimental plantations of softwood species—Object.*—To meet the over-growing demand of softwood	442
18 *Division of felling series.*—Two series of 75 acres each, 5 acres to be regenerated every year in each series	443
19 *Rotation.*—Twenty-five years	444
20 *Method of treatment—Demarcation.*—To be done by end of December ..	445
21 *Clearing.*—Fellings to be done departmentally, clearing, burning, etc., to be completed by 15th June	446
22 *Aligning and staking.*—To be done in Septemeber	447
23 *Espacement.*—9 feet × 9 feet	448
24 *Choice of species.*—*Ailanthus excelsa* and *Melia dubia*	449
25 *Planting.*—Transplanting prescribed to be done in October-November ..	450
26 *Weeding.*—Seedlings to be kept well weeded	451
27 *Protection.*—Seedlings to be protected from browsing and fire	452
28 *Nursery.*—*Melia dubia* to be sown in May of the year of regeneration ; *Ailanthus excelsa* to be sown in September prior to year of regeneration	453, 454
29 *Amerdi timber plantation.*—Climber cutting to be done at regular intervals, and thinnings to be done, if necessary	455
30 *Amerdi casuarina plantation.*—To be watched till the end of the rotation ..	456
31 *Amerdi* Melia dubia *plot.*—To be preserved and watched	457
32 *Tiruvannamalai casuarina plantation.*—To be regenerated with fast growing fuel species at the end of the rotation	458
33 *Malaria.*—Supply of Paludrine and D.D.T. prescribed	459
34 *Reserve boundaries.*—To be maintained by subordinates except where lines are overgrown	460
35 *Enclosure boundaries.*—To be maintained by subordinates with the help of villagers	461
36 *Control.*—Maintenance of control records and maps must receive the personal attention of the District Forest Officer	462
37 Control forms, Sandal Working Circle—	463
(i) Control of fellings, Form VIII.	
(ii) Record of yield, Form VIII (*a*).	
(iii) Felling Series Journal, Form IX.	
(iv) Control for sandal propagation plots, Form IX (*a*).	

Number of paragraph in working plan.

Miscellaneous Regulations—cont.

Control forms, Fuel and Small Timber Working Circle— 464
(i) Control of felling, Form XI.
(ii) Record of yield, Form XI (*a*).
(iii) Control of concentrated kumri regeneration, Form XII.
(iv) Control of Palar casuarina plantation fuel felling series, Form XII (*a*).
(v) Recording worked areas on fuel working maps.

Control forms, Bamboo Working Circle— 465
(i) Control of fellings, Form XIII.
(ii) Record of yield, Form XIII (*a*).

Control forms, Minor Forest Produce Working Circle— 466
(i) Control of working, Form XIV.
(ii) Record of yield, Form XIV (*a*).

Control forms, Green Leaf Manure Working Circle— 467
Control of grazing Form XVI 468

Control forms, whole Working Plan Area— 469
(i) Record of works.
(ii) Control of journal.
(iii) Deviation statement.
(iv) Fire map.

Establishment and Labour.

1 *Additional establishment required.*—None proposed 470
2 *Labour.*—Endeavour to be made to see the satisfactory working of the 'Forest Village System'. 471

APPENDIX I.

List of revenue taluks comprising the Vellore East Forest Division.

(*Reference*—Paragraph 3.)

Revenue district.	Taluks.	Area in squars miles.	Remarks.
North Arcot	Arkonam	319	
	Arni	176	
	Chengam	332	
	Cheyyar	328	
	Gudiyattam	100	Part only.
	Polur	589	
	Tiruvannamalai	375	
	Vellore	432	
	Walajapet	395	
	Wandiwash	340	
South Arcot	Kallakurichi	7	Pavinjipattu reserved forest only (4,313·88 acres).
	Total ..	3,803	

APPENDIX II.

Statement of monthly rainfall recorded at each rain gauge station during the period 1935–46.

(*Reference*—Paragraph 19.)

Year. (1)	January. (2)	February. (3)	March. (4)	April. (5)	May. (6)	June. (7)	July. (8)	August. (9)	September. (10)	October. (11)	November. (12)	December. (13)	Total. (14)	Remarks. (15)
							(1) *Thiruvalam* (*Vellore Range*).							
1943	..	..	..	..	..	..	0·25	4·07	1·15	28·29	2·53	32·00	68·29	Installed during 1943.
1944	..	20·00	1,71	1·01	..	3·18	1·93	22·00	14·46	2·58	9·29	3·91	80·07	
1945	..	..	..	0·88	0·48	..	4·26	4·10	2·21	0·21	3·42	..	15·56	
1946	045	..	0·13	0·25	2·77	2·09	2·05	2·23	6·33	7·27	6·07	11·83	41·47	
Total ..	0·45	20·00	1·84	2·14	3·25	5·27	8·49	32·40	24·15	38·35	21·31	47·74	205·39	
							(2) *Virinchipuram* (*Vellore Range*).							
1943	..	..	..	..	..	..	..	4·67	1·31	29·58	3·04	2·60	41·20	
1944	1100	..	2·40	0·45	0·12	1·51	3·53	3·57	4·93	5·93	9·58	1·89	44·92	
1945	..	..	..	0·99	1·69	0·30	2·86	4·21	3·77	0·45	3·64	..	17·91	
1946	..	..	..	..	2·36	1·97	1·21	3·12	6·39	4·42	10·86	12·16	42·48	
Total ..	11·00	..	2·40	1·44	4·17	3·78	7·60	15·57	16·40	40·38	27·12	16·65	146·51	
							(3) *Naickaneri* (*Odugathur Range*).							
1935	..	..	..	0·40	..	0·60	0·40	0·80	3·60	1·20	2·40	1·20	10·60	
1936	..	1·60	..	..	1·60	1·60	4·00	3·80	4·80	4·00	12·00	2·00	35·40	
1937	..	..	..	4·00	2·00	2·00	0·80	2·00	8·00	4·80	8·00	4·00	35·60	
1938	..	..	..	..	4·00	0·08	2·00	6·00	4·00	2·00	..	..	18·08	
1939	..	..	..	6·00	4·00	2·00	..	0·60	13·00	8·00	8·00	1·00	42·60	
1940	..	..	1·60	0·80	1·60	1·20	2·40	4·00	6·80	12·40	10·40	1·20	42·40	
1941	..	..	..	..	2·80	..	1·20	2·40	8·80	2·80	3·60	6·40	28·00	
1942	..	..	..	0·20	2·00	2·80	1·20	6·00	4·00	3·20	0·80	2·20	22·40	
1943	4·00	..	1·20	0·40	8·80	..	..	0·40	0·40	16·00	..	..	31·20	
1944	..	..	0·40	..	..	1·60	..	7·20	3·60	5·10	4·18	1·30	24·00	
1945	..	..	0·10	0·10	4·30	..	3·70	6·10	4·50	1·30	3·10	..	23·20	
1946	0·80	..	0·70	..	7·70	0·60	1·20	2·60	4·00	2·40	5·30	15·50	40·80	
Total ..	4·80	1·60	4·00	11·90	38·80	12·48	16·90	41·9	65·50	63·20	58·40	34·80	354·28	
							(4) *Shenbagatope* (*Santavasal Range*).							
1935	4·00	..	..	..	4·00	2·00	..	8·00	6·40	16·80	5·20	8·80	55·20	
1936	..	..	8·80	..	2·00	4·00	2·80	2·80	8·40	9·00	8·40	2·00	48·20	
1937	..	..	1·60	3·20	2·00	2·00	0·80	5·60	2·08	6·40	14·40	8·80	46·88	
1938	..	2·00	..	..	5·02	4·04	4·00	12·00	6·00	3·60	0·80	2·00	39·46	
1939	3·20	..	0·40	6·40	0·80	1·00	0·40	4·40	10·00	10·80	2·60	0·60	40·60	
1940	..	..	..	1·20	1·20	4·00	..	0·80	5·60	12·00	6·40	0·40	31·60	
1941	..	..	..	..	0·80	..	0·80	4·40	4·20	3·60	9·20	1·40	24·40	
1942	..	..	..	0·60	1·00	..	Not available			..	..	..	1·60	
1943	..	..	..	..	10·20	10·80	..	3·80	4·00	4·20	1·20	2·00	36·20	
1944	..	..	1·20	2·00	..	1·40	..	3·60	2·80	4·20	11·60	5·20	32·00	
1945	..	..	..	..	..	..	2·60	7·90	1·80	3·10	5·80	..	21·20	
1946	3·20	..	..	1·60	3·20	..	..	3·60	10·00	15·00	33·20	23·40	93·20	
Total ..	10·40	2·00	12·00	15·00	30·22	29·24	11·40	56·90	61·28	88·70	98·80	54·60	470·54	
							(5) *Amerdi* (*Santavasal Range*).							
1935	3·20	..	..	1·20	1·40	2·00	1·00	12·00	2·00	12·00	6·00	2·70	43·50	
1936	..	..	3·20	..	1·60	1·60	3·60	1·20	6·80	12·00	20·00	2·80	52·80	
1937	0·80	..	..	0·80	2·00	3·60	3·20	7·20	12·04	9·60	3·00	3·20	45·44	
1938	..	0·80	0·20	..	4·08	4·00	8·00	3·20	10·40	4·40	..	..	34·36	
1939	0·80	..	1·60	6·00	1·20	2·80	..	0·80	10·40	10·00	1·00	0·40	35·00	
1940	..	..	..	..	4·00	0·80	0·20	2·40	4·80	11·60	7·60	3·70	35·10	
1941	1·60	..	..	..	2·40	1·20	3·40	1·80	7·70	4·15	8·00	6·40	36·65	
1942	..	..	..	2·00	2·40	2·80	2·80	6·10	4·00	2·80	1·80	5·40	30·10	
1943	8·40	0·80	..	5·60	24·30	0·50	0·80	3·70	5·80	24·78	5·95	2·60	83·23	
1944	0·50	..	3·30	1·00	..	7·40	5·20	4·40	2·50	6·40	11·40	2·50	44·60	
1945	0·60	..	..	2·20	3·10	..	4·30	6·20	3·70	4·30	6·70	..	31·10	
1946	3·2	..	..	0·40	4·30	2·40	2·10	2·60	8·50	12·10	22·40	23·40	81·40	
Total ..	19·1	0·88	8·30	19·20	50·78	29·10	34·60	51·60	78·64	114·13	93·85	53·10	553·28	
							(6) *Moolakad* (*Polur Range*).							
1935	1·20	..	..	..	..	1·20	..	2·40	Not recorded—Rain gauge bottle broken.				4·80	
1936	..	..	1·50	..	1·22	0·60	..	..	1·00	9·00	14·50	7·00	34·82	
1937	..	..	..	3·50	2·00	..	..	12·00	19·75	8·60	18·50	2·00	66·35	
1938	..	1·25	..	..	1·87	3·06	3·25	6·25	0·75	0·63	..	..	17·06	
1939	..	..	0·25	4·25	0·75	0·50	..	..	7·50	19·25	3·50	..	36·00	
1940	..	..	2·00	4·00	..	0·50	..	3·12	1·77	14·38	5·68	..	31·45	
1941	..	..	..	..	2·18	..	..	2·50	16·15	1·25	3·25	..	25·33	
1942	..	..	..	..	..	..	..	13·55	3·75	8·26	1·70	1·32	28·58	
1943	2·60	0·25	6·19	..	19·29	..	3·50	3·20	7·88	20·72	..	..	63·63	
1944	..	..	8·00	..	..	0·54	0·95	0·30	0·15	2·75	5·72	7·50	25·91	
1945	..	..	..	..	1·89	0·64	3·95	8·22	1·50	12·50	4·00	..	32·70	
1946	0·27	..	0·45	..	0·65	..	0·45	0·50	9·97	8·18	13·23	10·63	44·33	
Total ..	4·07	1·50	18·39	11·75	29·85	7·04	12·10	52·04	70·17	105·52	70·08	28·45	410·96	

Statement of monthly rainfall recorded at each rain gauge station during the period 1935–46—**cont.**

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(7) *Patrakad* (*Polur Range*).														
1935	1·60	..	1·00	4·00	..	2·00	..	14·80	5·80	17·60	16·50	3·60	66·90	
1936	..	2·40	4·40	1·00	1·00	2·40	4·00	2·40	10·40	8·40	18·20	2·40	57·00	
1937	0·80	0·80	..	4·80	4·20	1·60	..	4·60	4·08	4·40	12·80	2·00	40·08	
1938	..	2·04	..	..	3·02	0·04	6·20	16·60	5·20	1·60	1·20	1·40	37·30	
1939	2·20	..	1·60	7·80	1·20	2·00	0·20	4·00	16·30	24·00	18·20	1·00	78·35	
1940	0·20	..	1·20	3·20	3·60	4·10	..	0·40	1·60	11·10	7·60	9·20	42·20	
1941	..	..	..	..	3·60	..	0·20	5·20	10·40	2·80	9·60	18·60	50·40	
1942	..	..	..	0·40	4·20	2·00	1·00	6·60	2·80	11·40	2·40	7·20	34·06	
1943	4·80	2·40	..	6·40	21·00	..	..	4·00	4·00	24·00	2·60	0·80	70·00	
1944	0·70	0·60	7·35	0·30	3·80	3·00	2·40	4·00	7·20	7·80	13·90	5·00	56·05	
1945	..	..	..	2·00	4·80	1·60	4·20	8·20	1·60	19·00	4·40	..	45·80	
1946	1·20	..	..	0·80	3·60	1·60	0·40	2·40	6·20	15·40	22·40	11·40	65·40	
Total	11·50	8·24	15·55	30·70	54·02	20·34	18·60	73·20	75·58	143·50	129·80	62·60	643·63	
(8) *Komattiyur* (*Polur Range*).														
1935	..	..	..	3·20	1·20	2·40	0·40	13·60	6·40	6·40	8·00	3·20	44·80	
1936	..	0·80	..	2·40	0·40	3·60	3·60	2·80	6·40	3·20	10·40	1·60	35·20	
1937	..	..	..	5·20	2·60	1·60	1·60	2·00	10·04	5·60	12·40	1·22	42·24	
1938	..	..	..	..	4·00	..	4·40	10·80	5·20	1·60	..	1·60	27·60	
1939	0·80	..	2·50	7·00	1·60	2·00	0·70	2·60	6·20	8·00	10·00	2·00	43·40	
1940	..	..	2·80	2·80	3·20	3·80	0·40	5·60	6·40	7·40	8·20	1·80	42·40	
1941	0·80	..	..	..	4·70	1·10	1·60	4·60	6·80	4·00	6·60	10·00	40·20	
1942	..	..	..	..	3·60	1·80	1·40	3·40	5·50	5·22	3·00	3·60	27·50	
1943	4·40	..	..	2·80	28·80	1·20	2·10	6·80	8·15	20·35	3·80	0·90	79·30	
1944	..	..	4·00	..	0·60	4·10	2·80	4·80	6·50	8·30	8·10	5·80	45·00	
1945	..	..	..	0·80	1·20	..	4·30	6·50	2·40	8·70	5·00	..	28·90	
1946	0·80	..	..	1·20	3·60	3·80	1·90	2·80	11·80	8·00	17·20	14·30	65·40	
Total	6·80	0·80	9·30	25·40	55·50	25·40	25·20	66·30	81·79	86·75	92·70	46·00	521·94	
(9) *Tanipadi* (*Tiruvannamalai Range*).														
1942	..	..	..	..	..	1·70	0·40	4·40	6·40	5·20	2·40	3·10	23·60	
1943	3·60	..	..	3·20	8·40	..	..	6·00	3·60	18·60	2·00	1·60	47·00	
1944	0·80	..	1·60	2·00	1·60	..	1·50	10·00	3·00	4·80	17·10	0·80	43·20	
1945	..	..	..	..	1·50	..	2·00	10·40	4·70	3·80	4·40	..	26·80	
1946	1·20	..	..	..	1·80	2·10	0·50	0·40	13·80	10·50	22·40	17·40	70·10	
Total	5·60	..	1·60	5·20	13·30	3·80	4·40	31·20	31·50	42·90	48·30	22·90	210·70	

APPENDIX III.

List of reserves transferred to panchayat control, North Arcot revenue district.

(*Reference*—Paragraph 34.)

Taluk.	Panchayat reserve.	Area in acres.	Date of transfer.
1 Arkonam	Uriyur	622·00	9th April 1918.
	Arkonam plantation	58·00	10th August 1926.
	Ammanur	207·00	19th August 1926.
	Kolathur A and B	1,729·00	6th April 1918.
2 Chengam	Kavuthimalai	6,983·00	1st August 1928.
	Eraiyurmalai	5,663·40	1917–18.
	Uchimalai	1,642·00	Do.
	Radhapuram	6,428·00	1st August 1928.
	Poovalai	3,061·00	1917–18.
	Chinniyambatti	2,276·00	Do.
	Royandapuram (part)	1,720·00	Do.
3 Cheyyar	Thandappanthangal	813·00	17th April 1918.
	Thandappanthangal A and B extension.	310·00	Do.
4 Polur	Kelur	2,974·00	1st March 1926.
	Pavathamalai	5,779·00	27th November 1926.
5 Tiruvannamalai	Annamalai	1,727·00	9th May 1927.
	Sorakolathur	5,714·00	1st July 1923.
	Thippakadu	4,324·00	1st August 1928.
	Kannamnadi	5,790·85	Do.
	Thatchampattu (part)	1,236·00	1st July 1923.
	Poolanjimalai	584·00	1st July 1926.
	Athipakkam	4,494·00	1st July 1923.

List of reserves transferred to panchayat control, North Arcot revenue district—**cont.**

Taluk.	Panchayat reserve.	Area in acres.	Date of transfer.
6 Vellore	Palamadi	8,160·00	19th July 1926.
	Kaniyambadi	5,472·00	17th and 18th January 1924.
	Pallikonda	3,898·00	7th July 1924.
	Paravamalai	7,078·00	1st July 1926.
7 Walajapet	Punganur	13,497·00	14th July 1926.
	Ammur	5,139·00	1st July 1923.
8 Wandiwash	Vengunam	884·00	20th November 1914.
	Ponnur	1,656·00	9th October 1914.
	Badur A	489·00	30th April 1918.
	Nedunguniam	1,566·00	15th October 1914.
	Vishamangalam	828·00	17th October 1914.
9 Gudiyattam	Bommanaikapalayam ..	912·00	4th October 1917.
	Kunjanur	1,149·00	
	Panamadangi	10,314·00	
	Total ..	125,177·25	

APPENDIX IV.

G.O. No. 1462, Revenue, dated 10th June 1907.

(*Reference*—Paragraph 35.)

Forest No. 67.—The Board of Revenue submits proposals for the treatment of the occupied lands within forest reserves of the Javadi Hills in the North Arcot district and for the treatment of trees standing thereon.

2. The Government agree with the Board that the land assigned on patta, together with such land as it may be desirable to set apart for the extension of cultivation and for the exercise of communal privileges, should be retained as enclosures within the reserves. Before the boundaries are finally notified these enclosures should be inspected by the Collector or Divisional Officer to ensure that sufficient land has been allowed for the extension of cultivation and for the exercise of communal privileges and by the District Forest Officer to verify the suitability and accuracy of the boundary determined.

3. The Government do not approve of the Conservator's suggestion that the enclosures, as finally settled, should be notified by the publication of errata to the original forest settlement notifications. They consider that the enclosures should be formally disafforested. The Board will accordingly be requested to submit, in due course, a statement showing the area originally admitted and that now allowed under the heads, occupied land, unoccupied waste and poramboke in respect of each reserve, as well as the necessary disafforesting notification. The Board should also submit a sketch showing the position of all enclosures in the reserves. As observed in paragraph 6 of the Board's Reference, the issue of pattas already sanctioned by Government need not be delayed.

4. The Board's recommendations that all trees except sandal may be made over to the cultivators without collection of tree value and that the ownership of sandal trees wherever situated should be reserved to Government, are accepted. A condition should be entered in the pattas to the effect that the pattadar has no right to any sandal trees growing on the land and if possible, an agreement should be taken from the pattadar binding him to look after the trees (vide paragraph 7 of Board's Proceedings, Forest No. 14, dated 19th January 1907).

5. The Government approve of the Board's proposal to cancel ordinary as well as bilmukta pattas for trees located on land held on patta or yearly (sivayijama) tenure.

(True extract.)

A. G. Cardew,
Acting Secretary to Government.

To the Board of Revenue (Land Revenue), with one map.
Copy to the Board of Revenue (Revenue Settlement).

Resolution—Forest No. 119, *dated* 20*th June* 1907.

Communicated to the Collector of North Arcot and the Conservator of Forests, Central Circle.

2. The Collector is requested to carry out the instructions contained in the Government Order and to submit to the Board in due course the statement, draft notification and the sketch referred to in paragraph 3.

(True extract)

F. B. EVANS,
Acting Secretary.

To the Collector of North Arcot (with sketch and copy of Board's Proceedings, Forest No. 14, dated 19th January 1907).

„ Conservator of Forests, Central Circle (with a copy of Board's Proceedings, Forest No. 14, dated 19th January 1907).

Copy to the Land Revenue Section.

APPENDIX V.

Agreement executed by pattadar No.

(*Reference*—Paragraph 35.)

, son of aged profession, living in village, taluk, district, on 1912 in consideration of the grant of patta to the said

I/We agree that I/We have no title, right or claim to any sandalwood tree found on my/our land and I/we shall protect all such trees until they are felled under orders in writing of the District Forest Officer, South Vellore, for the time being and that I/we shall not cut, lop, break or otherwise injure them as long as they remain on my/our land.

2. In case any sandalwood tree standing on my/our land is illicitly removed therefrom or damaged in any way, I/we agree to pay compensation to Government to the extent of the value of the tree or of the loss caused to Government by such cutting, lopping, breaking or otherwise damaging the tree as may be fixed by the District Forest Officer subject to appeal to the Collector whose decision shall be final.

APPENDIX VI-A.

Botanical lists arranged alphabetically according to natural orders.

Serial number and natural order.		*Botanical name.*	*Tamil name.*
		A. Trees.	
1	Anacardiace	*Anacardium occidentale*	Mundiriparuppu maram.
2	Do.	*Buchanania latifolia*	Sara-paruppu maram.
3	Do.	*Buchanania lanceolata*	Muda mali maram.
4	Do.	*Lannea grandis*	Odian maram.
5	Do.	*Mangifera indica*	Mamaram.
6	Do.	*Odina wodier*	Oodia maram.
7	Do.	*Semecarpus anacardium*	Seram-kottai maram.
8	Anonaceae	*Anona reticulata*	Rama-palam maram.
9	Do.	*Anona squamosa*	Seetha-palam maram.
10	Do.	*Polyalthia cerasoides*	Kothu-kala maram.
11	Apocynaceae	*Alstonia schclaris*	Pola-garuda maram.
12	Do.	*Holarrhena antidysenterica*	Karu-palai, Godachali maram.
13	Do.	*Plumeria acutifolia*	Navila maram.
14	Do.	*Thevetia neriifolia*	Thiruvachipu maram.
15	Do.	*Wrightia tinctoria*	Palai maram.
16	Do.	*Wrightia tomentosa*	Veppalai maram.
17	Bignoniaceae	*Dolichandrone falcata*	Klarvalattu maram.
18	Do.	*Dolichandrone crispa*	....
9	Do.	*Millingtonia hortensis*	Mara-malii maram.
0	Do.	*Stereospermum chelonoides*	Poom-padiri, Kalloti maram.
11	Do.	*Stereospermum suaveolens*	Padri maram.
22	Do.	*Stereospermum xylocarpum*	Vedam Kurunai maram, Kadalatti maram.

Botanical lists arranged alphabetically according to natural orders—cont.

Serial number and natural order.	*Botanical name.*	*Tamil name.*
	A. Trees—cont.	
23 Bixaceae	*Cochlospermum gossypium*	Odia maram.
24 Do.	*Hydnocarpus wightiana*	Maravatti maram.
25 Boraginaceae	*Cordia myxa*	Nervali maram.
26 Burseraceae	*Balsamodendron berryi*	Mul-kilvai maram.
27 Do.	*Boswellia serrata*	Chupam maram, Kungiliam. maram.
28 Do.	*Garuga pinnata*	Karu-vembu maram.
29 Do.	*Protium caudatum*	Pachaikilvai maram.
30 Capparidaceae	*Crataeva religiosa*	Mavilangai maram.
31 Celastraceae	*Elaeodendron glaucum*	Keeri maram, Veeri maram.
32 Do.	*Pleurostylia wightii*	....
33 Combretaceae	*Anogeissus latifolia*	Namai maram.
34 Do.	*Anogeissus acuminata*	Namai maram.
35 Do.	*Terminalia arjuna*	Maddi maram, Nermaddi maram.
36 Do.	*Terminalia belerica*	Thani maram, Thandri maram.
37 Do.	*Terminalia chebula*	Kadukai maram.
38 Do.	*Terminalia paniculata*	Pillamarudu maram, Maddi maram.
39 Do.	*Terminalia tomentosa (crenulata)*	Karu-marudu maram.
40 Coniferae	*Casuarina equisetifolia*	Chowk maram.
41 Cornaceae	*Alangium lamarckii*	Alingi maram.
42 Dipterocarpaceae	*Shorea talura*	Jaleri maram.
43 Ebenaceae	*Diospyros chloroxylon*	Karuvakkanai maram.
44 Do.	*Diospyros melanoxylon*	Thumbi, Karum-thumbi maram.
45 Do.	*Diospyros montana*	Vakkanai maram.
46 Do.	*Diospyros ovalifolia*	Kadu-thoomparai maram.
47 Do.	*Maba buxifoilo*	Chinerumboli maram.
48 Euphorbiaceae	*Bridelia montana*	Mulla-vengai maram.
49 Do.	*Bridelia retusa*	Mulla-vengai maram.
50 Do.	*Cleisanthus collinus*	Woddan maram.
51 Do.	*Euphorbia trigona*	Pal-kalli maram.
52 Do.	*Givotia rottleriformis*	Velthdia maram.
53 Do.	*Mallotus philippinensis*	Kamala-podi maram.
54 Do.	*Phyllanthus emblica*	Nelli maram.
55 Do.	*Phyllanthus polyphyllus*	....
56 Do.	*Trewia nudiflora*	Kumbla maram.
57 Hernandiaceae	*Gyrocarpus americanus (jacquini)*	Kosu-thamaku maram.
58 Lauraceae	*Alseodaphne emecurpifolia*	Kaka-nagai.
59 Leguminosae	*Acacia arabica*	Karuvela maram.
60 Do.	*Acacia ferruginea*	Paramba maram.
61 Do.	*Acacia leucophloea*	Vel-vela maram, Sarai maram.
62 Do.	*Acacia lenticularis*	....
63 Do.	*Acacia senegal*	....
64 Do.	*Acacia sundra*	Karungali maram.
65 Do.	*Albizzia amara*	Thuringi maram.
66 Do.	*Albizzia lebbek*	Kattu-vagai maram.
67 Do.	*Albizzia odoratissima*	Karu-vagai maram, Kalthuringi maram.
68 Do.	*Albizzia procera*	Nal-velangu maram.
69 Do.	*Bauhinia racemosa*	Chitha-acha-maram, Maramathi maram.
70 Do.	*Buteau frondosa*	Porasu, Muruku maram.
71 Do.	*Cassia fistula*	Konnai maram.
72 Do.	*Cassia siamea*	Pon-avarai, Karumkonnai maram.
73 Do.	*Dalbergia lanceolata*	Velangu maram.
74 Do.	*Dalbergia latifolia*	Etti maram.
75 Do.	*Dalbergia paniculata*	Pachali maram.
76 Do.	*Dalbergia sissoides*	Sisoo maram.
77 Do.	*Dalbergia sisoo*	Sisoo maram.
78 Do.	*Delonix elata*	Vatanarayana maram.
79 Do.	*Dichrostachys cinerea*	Vedadara, Veduthalam maram.
80 Do.	*Enterlobium saman*	Mal, Thungumungi maram.
81 Do.	*Erythrina indica*	Mulkurukku maram.
82 Do.	*Erythrina suberosa*	Murukku maram.
83 Do.	*Hardwickia binata*	Acha maram.
84 Do.	*Ougeina dalbergioides*	Naiponnai maram.
85 Do.	*Pithecolobium dulce*	Kodukkapulli maram.
86 Do.	*Pithecolobium saman*	Seemai Kothuvai maram.
87 Do.	*Pongamia glabra*	Punga maram.
88 Do.	*Pterocarpus marsupium*	Vengai maram.
89 Do.	*Pterocarpus santalinus*	Chem maram.
90 Do.	*Tamarindus indica*	Pulia maram.
91 Lineae	*Erythroxylon monogynum*	Chembulicha maram.
92 Longaniaceae	*Strychnos nux-vomica*	Etti maram.
93 Do.	*Strychnos potatorum*	Thethankottai maram.
94 Lythraceae	*Lagerstraemia lanceolata*	Ventheku, Chinnarigi maram.
95 Do.	*Lagerstraemia parviflora*	Pe-kadukkai maram.
96 Malvaceae	*Bombax malabaricum*	Elava maram.
97 Do.	*Eriodendron anfractuosum*	Poola maram.
98 Do.	*Kydia calycina*	Pulabendi maram.
99 Do.	*Thespesia populnea*	Puvarasu maram.
100 Melastomaceae	*Memecylon edule*	Kasan maram.
101 Do.	*Memecylon umbellatum*	Perum-kasan.
102 Meliaceae	*Chukrasia tabularis*	Arunelli maram.
103 Do.	*Melia composita*	....
104 Do.	*Melia (azadirachta) indica*	Vepa maram.
105 Do.	*Melia dubia*	Malavembu maram.
106 Do.	*Soymida febrifuga*	Sombupattai maram.
107 Moraceae	*Ficus bengalensis*	Alai maram.
108 Do.	*Ficus gibbosa*	....
109 Do.	*Ficus glomerata*	Athi maram.

Botanical lists arranged alphabetically according to natural orders—cont.

Serial number and natural order.	*Botanical name.*	*Tamil name.*
	***A.** Trees*—cont.	
110 Moraceae	*Ficus hispida*	Chon-athi-maram.
111 Do.	*Ficus religiosa*	Arasa maram.
112 Do.	*Ficus retusa*	Kalluichi maram.
113 Do.	*Ficus tsiela*	Kallathi maram.
114 Do.	*Streblus asper*	Kuttipala marm, Chinikoran maram.
115 Moringaceae	*Moringa concanensis*	Kattu-murungai maram.
116 Do.	*Moringa pterygosperma*	Murungai maram.
117 Myrtaceae	*Barrintonia acutangula*	Kaddpay maram.
118 Do.	*Careya arborea*	Kalkambi maram.
119 Do.	*Eugenia jambolana*	Nagai maram.
120 Do.	*Psidium guayava*	Koyyappala maram.
121 Oleaceae	*Linociera intermedia*	Ellu-kanalu.
122 Do.	*Olea dioica*	Koli maram.
123 Do.	*Olea glandulifera*	Kattu-kallari
124 Do.	*Schrebera swietenioides*	Mongalinga maram.
125 Palamae	*Borassus flabellifer*	Panai maram.
126 Do.	*Caryota urens*	Kundal panaimaram.
127 Palmae	*Phoinix sylvestris*	Eecha maram.
128 Pittosporaceae	*Pittosporum floribundum*	Thammattan.
129 Rhamnaceae	Zizyphus jujuba	Yelandai maram.
130 Do.	*Zizyphus Xylopyraos*	Mul-upai maram.
131 Rubiaceae	*Adina cordifolia*	Manja-kadambai maram.
132 Do.	*Canthium didymum*	Naluvai, Nekkini maram.
133 Do.	*Gardenia gummifera*	Kambili-pislna maram.
134 Do.	*Gardenia latifolia*	Kothu-marikalan maram.
135 Do.	*Hymenodictyon excelsum*	Nerkadamba maram.
136 Do.	*Ixora parviflora*	Kora maram.
137 Do.	*Mitragyna parviflora (Stephegyne)*	Nirkadambai maram.
138 Do.	*Morinda citrifolia*	Nona maram.
139 Do.	*Morinda tinctoria*	Manjanathi nona maram.
140 Do.	*Randia brandisii*	Perum-karai.
141 Do.	*Randia uliginosa*	Vagatta maram.
142 Rutaceae	*Aegle marmelos*	Bilva maram.
143 Do.	*Chloroxylon swietenia*	Porasu, Borasu maram.
144 Do.	*Citrus medica*	Elumuchi maram.
145 Do.	*Feronia elephantum*	Vila maram.
146 Do.	*Limonia acidissima*	Narivala maram.
147 Do.	*Limonia crenulata*	Nalvala maram.
148 Do.	*Murraya koenigii*	Karuveppalai maram.
149 Do.	*Murraya exotica*	Katukaruveppalai maram.
150 Samydaceae	*Casearia tomentosa*	....
151 Santalaceae	*Santalum album*	Sandana maram.
152 Sapindaceae	*Pistacia oleosa*	Kadal-murichi maram.
153 Do.	*Sapindus emarginatus*	Poovamkottai maram.
154 Do.	*Sapindus laurifolius*	Karadipoongai maram.
155 Do.	*Schleichera trijuga*	Pulchi maram.
156 Sapotaceae	*Bassia latifolia*	Illuppai maram.
157 Do.	*Mimusops elengi*	Magadam maram.
158 Do.	*Mimusops hexandra*	Palae maram.
159 Simarubaceae	*Ailanthus excelsa*	Pee maram, Pee Nari maram.
160 Do.	*Balanites roxiburghii*	Manjunda maram.
161 Sterculiaceae	*Pterospetmum heyneanum*	Udupai maram.
162 Do.	*Pterospermum suberifolium*	Muruvankai maram.
163 Do.	*Sterculia villosa*	Kotta thanuku maram.
164 Do.	*Sterculia urens*	Chin-thanuku maram.
165 Tiliaceae	*Grewia tilioefolia*	Thadachi maram, Thadsu maram.
166 Ulmaceae	*Holoptelea integrifolia*	Thavasi maram.
167 Urticaceae	*Artocarpus integrifolia*	Pela maram.
168 Verbenaceae	*Gmetina arborea*	Kumalam maram.
169 Do.	*Premna tomentosa*	Kolakattaitheku maram.
170 Do.	*Tectona grandis*	Theku maram.
171 Do.	*Vitex altissima*	Mayil-adi maram.
172 Do.	*Vitex negundo*	Nochi maram.
	***B.** Bamboo.*	
173 Gramineae	*Bambusa arundinacea*	Peruvarai moongil.
174 Do.	*Dendrocalamus strictus*	Siruvarai moongil.
	***C.** Shrubs.*	
175 Acanthaceae	*Adhatoda vasica*	Adathodai.
176 Do.	*Strobilanthes*	Kurungi.
177 Apocynaceae	*Carissa carandas*	Kila, Cherumkila.
178 Do.	*Carissa spinarum*	Sirukila.
179 Anacardiaceae	*Rhus mysorensis*	Chippa maram.
180 Do.	*Rhus lineatus*	....
181 Asclepiadaceae	*Calotropisgigantea*	Yerukku.
182 Do.	*Hemidesmus indicus*	Nannari.
183 Bixaceae	*Flacourtia ramontchi*	Kothu Vela.
184 Do.	*Flacourtia sepiaria*	....
185 Boraginaceae	*Ehretia buxifolia*	Kuruvanji.
186 Cactaceau	*Opuntia dillenii*	Mullukalli, Nagathali.
187 Capparidaceae	*Capparis sepiaria*	Kattu Kathrii.
188 Celastraceae	*Gymnosporia hayneana*	Kattanji.
189 Do.	*Gymnosper ia montona*	Kattanji.
190 Euphorbiaceae	*Acalypha fruticosa*	Cinni.
191 Do.	*Breyniarhamnoides*	Sigappu-poola.

Botanical lists arranged alphabetically according to natural orders—cont.

Serial number and natural order.		*Botanical name.*	*Tamil name.*
		C. Shrubs—cont.	
192	Euphorbiaceae	*Croton lawianus*	Kottai-mankku.
193	Do.	*Fluggea leucopyrus*	Kottu Veppulam.
194	Do.	*Fluggea microcarpa*	Vellai Poola.
195	Do.	*Hemicyclia sopiaria*	Virai, Velalilambu.
196	Do.	*Jatropha curcas*	Kattuamanakku.
197	Labiatae	*Ocimum gratissima*	Thulasi.
198	Do.	*Ocimum sancoum*	Karumthulasi.
199	Leguminosae	*Acacia latronum*	Kodivelam.
200	Do.	*Aeschynomeene aspera*	Netti.
201	Do.	*Cassia auriculata*	Avaram, Avarai.
202	Do.	*Cassia occidentale*	Pon-avarai.
203	Do.	*Cassia tora*	Thagara, Ossithagara.
204	Do.	*Desmodium pulchellum*	Narjuruvi.
205	Do.	*Flemingia chapper*	....
206	Do.	*Indigofera paucifolia*	Poola.
207	Do.	*Mimosa rubicaulis*	Kattu-seekai.
208	Do.	*Tephrosia perpurea* (*Mendulea suberosa*)	Kavali.
209	Liliaceae	*Aloe vera*	Kathali.
210	Lythraceae	*Lawsonia inermis*	Aivanam.
211	Malpighiaceae	*Hiptage madablota*	Madu-malati, Karuvathi.
212	Mallaceae	*Pavonia zeylanica*	....
213	Mellaceae	*Cipadessa fruticosa*	Savatu chadi.
214	Oleaceae	*Nyctanthes arbortristis*	Pavelum.
215	Do.	*Ximenia americana*	Kale.
216	Palmae	*Phoenix acaulis*	Eechampul
217	Do.	*Phoenix humilis*	Siruinji
218	Pandanaceae	*Pandanus tectorius*	Thalai.
219	Plumbaginaceae	*Plumbago zeylanica*	....
220	Rhamnaceae	*Rhamnus wightii*	....
221	Do.	*Scuta indica*	Kokki mullu.
222	Do.	*Zizyphus nummularia*	Nari-yelandai.
223	Do.	*Zizhyphus oenoplia*	Sorrai.
224	Do.	*Zizyphus glabrata*	Kottai yelandai.
225	Rubiaceae	*Canthium parviflorum* (*plectronia*)	Sengarai.
226	Do.	*Chometia asiatica*	Thirani.
227	Do.	*Pavetta indica*	Pavattai.
228	Do.	*Randia dumetorum*	Karai, Marivalan, Marakalam.
229	Do.	*Webera asiatica*	Chintharani.
230	Do.	*Webera corymbosa*	Tharni.
231	Rutaceae	*Atlantia monophylla*	Kattu elimichi.
232	Do.	*Clausena indica*	Nana.
233	Do.	*Parmignya monophylla*	Molongarani.
234	Do.	*Toddalia asiatica*	Molacaranai.
235	Do.	*Toddalia aculeata*	Kattu molaga, Porivalan.
236	Sapindaceae	*Allophylus cobbe*	Siru-sale.
237	Do.	*Allophylus serratus*	Kuva-Koothi.
238	Do.	*Dodonaea viscosa*	Vellari.
239	Solanaceae	*Datura fastiosa*	Vel-oomathu.
240	Do.	*Datura stramonium*	Oomathu.
241	Do.	*Solanum trilobatum*	Sundakkai.
242	Do.	*Solanum xanthocarpus*	Kandamkathari.
243	Do.	*Solanum verbascifolium*	Anaisundakkao.
244	Do.	*Solanum giganteum*	Sambal Kiluvai.
245	Sterculiaceae	*Helicteres isora*	Valamburi, Idamburi.
246	Tiliaceae	*Grewia hirsuta*	....
247	Do.	*Grewias colunnaris*	....
248	Verbenaceae	*Lantana indica*	Unni.
249	Zingiberaceae	*Zingiber casumunar*	Kattu manjal.
		D. Climbers.	
250	Ampelideae	*Ampelocissus latifolia*	Kattu Kodimundari.
251	Do.	*Cassus quardrangularis*	Perandai.
252	Anonaceae	*Uvaria narum*	Kattu valai.
253	Apocynaceae	*Ichnocarpus frutescens*	Oothal Kodi.
254	Aristolochiaceae	*Aristolochia indica*	....
255	Asclepiadaceae	*Gymnema sylvestre*	Sirupalai kodi.
256	Do.	*Pergularia extensa*	Seendal kodi.
257	Do.	*Secamone emetica*	Seerai kodi.
258	Celastracae	*Celastrus paniculata*	....
259	Combretaceae	*Combretum ovalifolium*	Vennangu kodi.
260	Corvolvulaceae	*Argyreia speciosa*	Kakattan.
261	Do.	*Cuscutta*	....
262	Do.	*Lettsomia elliptica*	Onan kodi.
263	Dioscoreaceae	*Dioscorea hispida*	Kaval kodi
264	Do.	*Dioscorea pentaphylla*	Kattu velli.
265	Leguminosae	*Abrus precatorius*	Kundumani.
266	Do.	*Abrus pulchellus*	Vellai kundumani.
267	Do.	*Acacia caesia*	Kari karan, Vellandu.
268	Do.	*Acacia concinna*	Seekayi.
269	Do.	*Acacia inssia*	Indu mullu.
270	Do.	*Bauhinia vahlii*	Kattu mandarai.
271	Do.	*Butea superba*	....
272	Do.	*Caesalpinia bonducella*	Gajjikai, Kalachikai.
273	Do.	*Canvalia virosa*	....
274	Do.	*Derris scandens*	Pnuali.
275	Do.	*Millettia auriculata*	....
276	Do.	*Mucuna gigantea*	Kakkavali.
277	Do.	*Pterolobium indicum*	Kari-indi-Pulithadiki.
278	Do.	*Spaholobus roxburghii*	Karru avarai kodi.

Botanical lists arranged alphabetically according to natural orders—cont.

Serial number and natural order.	*Botanical name.*	*Tamil name.*
	D. Climbers—cont.	
279 Liliaceae	*Asparagus racemosus*	Thannuta kodi.
280 Do.	*Gloriosa superba*	Konnoou.
281 Do.	*Smilax zeylanica*	....
282 Lineae	*Hugonia mystax*	Kodi veerai.
283 Minispermaceae	*Cocculus villosus*	Kotu kodi.
284 Oleaceae	*Jasminum arborescens*	Kattu malligai.
285 Ranuneulaceae	*Narvelia zeylanica*	Naruvalan kodi.
286 Rhamnaceae	*Ventilage calyculata*	Surai, vembalam.
287 Do.	*Ventilage madraspatna*	Vembalam.

APPENDIX VI-B.

Botanical lists arranged alphabetically according to Tamil names.

Serial number and Tamil name.	*Botanical name.*	*Natural order.*
	A. Trees.	
1 Acha maram	*Hardwickia binata*	Leguminosæ.
2 Alai maram	*Ficus bengalensis*	Moraceæ.
3 Alingi maram	*Alangium lamarckii*	Cornaceæ.
4 Arsa maram	*Ficus religiosa*	Moraceæ.
5 Arunelli maram	*Chukrasia tabularis*	Meliaceæ.
6 Athi maram	*Ficus glomerata*	Moraceæ.
7 Bilva maram	*Aegle marmelos*	Rutaceæ.
8 Borasu maram	*Chloraxylon swietenia*	Do.
9 Chembulicha maram	*Erythroxylon monogynum*	Lineæ.
10 Chem maram	*Pterocarpus santlainus*	Leguminosæ.
11 Chinerumboli maram.	*Maba buxifolia*	Ebanaceæ.
12 Chini-koran maram	*Streblus asper*	Moraceæ.
13 Chinnarigi maram	*Lagerstroemia lanceolata*	Lythraceæ.
14 Chin-thanaku maram.	*Sterculia urens*	Sterculiaceæ.
15 Chitha acha maram	*Bauhinia racemosa*	Leguminosæ.
16 Chon athi maram	*Ficus hispida*	Moraceæ.
17 Chowk maram	*Casuarina equisetifolia*	Coniferæ.
18 Dhupam maram	*Boswellia serrata*	Burseraceæ.
19 Eecha maram	*Phoenix sylvestris*	Palmæ.
20 Etti maram	*Dalbergia latifolia*	Leguminosæ.
21 Elava maram	*Bombax malabaricum*	Malvaceæ.
22 Ellu-kanalu maram	*Linociera intermedia*	Oleaceæ.
23 Elumuchi maram	*Citrus medica*	Rutaceæ.
24 Etti maram	*Strychnos nux vomica*	Loganiaceæ.
25 Godachali maram	*Holarrhena antidysenterica*	Apocynaceæ.
26 Iluppai maram	*Bassia latifolia*	Sapotaceæ.
27 Jaleri maram	*Shoreae talura*	Dipterocarpaceæ.
28 Kadal-murichi maram.	*Pistacia oleosa*	Sapindaceæ.
29 Kadalatti maram	*Stereospermum xyloarpum*	Pignoniaceæ.
30 Kaddapay maram	*Barringtonia acutangula*	Myrtaceæ.
31 Kadukai maram	*Terminalia chebula*	Combretaceæ.
32 Kadu-thoomparai maram.	*Diospyros ovalifolia*	Ebenaceæ.
33 Kaka-nagai maram	*Alseodaphne semicarpifolia*	Lauraceæ.
34 Kalkambi maram	*Careya arborea*	Myrtaceæ.
35 Kal-thuringi maram	*Albizzia odoratissima*	Leguminosæ.
36 Kallu-athi maram	*Ficus tsiela*	Moraceæ.
37 Kalluichi maram	*Ficus retusa*	Do.
38 Kamalapodi maram	*Mallotus philippinensis*	Euphorbiaceæ.
39 Kambili-pisina maram.	*Gardenia gummifera*	Rubiaceæ.
40 Karu-vagai maram	*Albizzia odoratissima*	Leguminosæ.
41 Karum-konnai maram.	*Cassia siamea*	Do.
42 Karumgali maram	*Acacia sundara*	Do.
43 Karuveppallai maram.	*Murraya koenigii*	Ruttaceæ.
44 Karu-marudu maram.	*Terminalia tomentosa*	Combretaceæ.
45 Karuvakkanai maram.	*Diospyros chloroxylon*	Ebenaceæ.
46 Karum-thumbi maram.	*Diospyros melanoxylon*	Do.
47 Karuvela maram	*Acacia arabica*	Leguminosæ.
48 Karupalai maram	*Holarrhena antidysenterica*	Apocynaceæ.
49 Karuvembu maram	*Garuga pinnata*	Burseraceæ.
50 Karadipoongai maram.	*Sapindus laurifolius*	Sapindaceæ.
51 Kasan maram	*Memecylon edule*	Melastomaceæ.
52 Kattu-kallari maram.	*Olea glandulifera*	Oleaceæ.
53 Kattukaruveppalai maram.	*Murrya exotica*	Rutaceæ.
54 Kattumurungai maram.	*Muringa concanensis*	Moringaceæ.
55 Kattu-vagai maram	*Albizzia lebbek*	Legumiosæ.
56 Keeri maram	*Elaodendron glaucum*	Celastraceæ.
57 Klarvalathu maram	*Dolichandrone falcata*	Bignoniaceæ.
58 Kodukkapulli maram	*Pithecolobium dulce*	Leguminosæ.
59 Kolakattai theku maram	*Premna tomentosa*	Verbenaceæ.
60 Koli maram	*Olea dioica*	Oleaceæ.
61 Konnai maram	*Cassia fistula*	Leguminosæ.
62 Kora maram	*Ixora parviflora*	Rubiaceæ.
63 Kosu-thamaku maram.	*Gyrocarpus americanus* (*jacquinii*)	Hernandiaceæ.
64 Kothu-marikalam maram.	*Gardenia latifolia*	Rubiaceæ.
65 Kattai-thanaku maram.	*Sterculia villosa*	Sterculiaceæ.
66 Koyyappala maram	*Psidium guayava*	Myrtaceæ.
67 Kothu-kala maram	*Polyalthica cerasoides*	Anonaceæ.
68 Kumbla maram	*Trewia nudiflora*	Euphorbiaceæ.
69 Kumalam maram	*Gmelina arborea*	Verbenaceæ.
70 Kundalpanai maram	*Caryota urens*	Palmæ.
71 Kungiliam maram	*Boswellia serrata*	Burseraceæ.

Botanical lists arranged alphabetically according to Tamil names—cont.

Serial number and Tamil name.	*Botanical name.*	*Natural order.*
	A. Trees—cont.	
72 Kuttipala maram	*Stereblus asper*	Moraceæ.
73 Maddi maram	*Terminalia arjuna*	Combretaceæ.
74 Maddi maram	*Terminalia paniculata*	Do.
75 Magadam maram	*Mimusops elengi*	Sapotaceæ.
76 Mal maram	*Enterlobium saman*	Leguminoseæ.
77 Malavembu maram	*Melia dubia*	Meliaceæ.
78 Ma maram	*Mangifera indica*	Anacardiaceaæ.
79 Manjanathinona maram.	*Morinda tinctoria*	Rubiaceæ.
80 Manjakadambai maram.	*Adina cordifolia*	Do.
81 Manjunda maram	*Balanites roxburghii*	Simarubaceæ.
82 Maramalli maram	*Millingtonia hortensis*	Bignoniaceæ.
83 Mara-mathi maram	*Bauhinia racemosa*	Leguminosæ.
84 Maravatti maram	*Hydnocarpus wightiana*	Bixaceæ.
85 Mavilangai maram	*Crataeva religiosa*	Capparidaceæ.
86 Mayil-adi maram	*Vitex altissima*	Verbenaceæ.
87 Mogalinga maram	*Schrebra swieteniodes*	Oleaceæ.
88 Muda mali maram	*Buchania lanceolata*	Anacardiaceæ.
89 Mul-upai maram	*Zizhphus xylopyrus*	Rhamnaceæ.
90 Mul-kilvai maram	*Balsamodendron berryi*	Burseraceæ.
91 Mullu-vengai maram.	*Bridelia montana*	Euphorbiaceæ.
92 Mullu-vengai maram.	*Bridelia retusa*	Leguminosæ.
93 Mulmuruku maram	*Eryrhrina indica*	Do.
94 Mundiriparappu maram.	*Anacardium Occidentale*	Anacardiaceæ.
95 Murukku maram	*Erythrina suberosa*	Do.
96 Muruku maram	*Butea frondosa*	Leguminosæ.
97 Murungai maram	*Moringa pterygosperma*	Moringaceæ.
98 Muruvankai maram	*Pterospermum suberifolium*	Sterculiaceæ.
99 Nagai maram	*Eugenia jambolana*	Myrtaceæ.
100 Naiponnai maram	*Cugeinia dalbergioides*	Leguminosæ.
101 Naluvai, Nekkini maram.	*Canthium didymum*	Rubiaceæ.
102 Nalvala maram	*Limonia crenulata*	Rutaceæ.
103 Nal-velangu maram	*Albizzia procera*	Leguminosæ.
104 Namai maram	*Anogeissus latifolia*	Combretaceæ.
105 Namai maram	*Anogeissus acuminata*	Do.
106 Narivala maram	*Limonia acidissima*	Rutaceæ.
107 Navila maram	*Plumeria acutifolia*	Apocynaceæ.
108 Nelli maram	*Phyllanthus emblica*	Eupherbiaceæ.
109 Norvali maram	*Cordia myxa*	Boraginaceæ.
110 Nerkadamba maram	*Hymenodictyon excelsum*	Rubiaceæ.
111 Nermaddi maram	*Terminalia arjuna*	Combretaceæ.
112 Nirkadambai maram	*Mitragyna parviflora* (*Stephegyne*)	Rubiaceæ.
113 Nona maram	*Morinda citrifolia*	Do.
114 Nochi maram	*Vitex negundo*	Verbenaceæ.
115 Odia maram	*Cochlospermum gossypum*	Bixaceæ.
116 Odian maram	*Lannea grandis*	Anacardiaceæ.
117 Oodia maram	*Odina wodier*	Do.
118 Pachali maram	*Dalbargia paniculata*	Leguminosæ.
119 Pachai-kilvai maram	*Protium caudatum*	Burseraceæ.
120 Padri maram	*Sterospermum suaveolens*	Bignoniaceæ.
121 Palae maram	*Mimusops hexandra*	Sapotaceæ.
122 Pala-garuda maram	*Alastonia scholaris*	Apocynaceæ.
123 Palai maram	*Writhtia tinctoria*	Do.
124 Palkalli maram	*Euphorbia trigona*	Euphorbiaceæ.
125 Panai maram	*Borassus flabellifer*	Palmæ.
126 Paramba maram	*Acacia ferruginea*	Legumicnoæ.
127 Pee maram	*Ailanthus excelsa*	Simarubaceæ.
128 Pee-nari maram	*Ailanthus excelsa*	Do.
129 Pela maram	*Artocarpus integrifolia*	Urticaceæ.
130 Pe-kadukkai maram	*Lagerstroemia parviflora*	Lythraceæ.
131 Perum-karai maram	*Randia brandisii*	Rubiaceæ.
132 Perum-kasam maram.	*Memecylon umbellatum*	Melastomaceæ.
133 Pillamarudu maram	*Terminalia paniculata*	Combretaceæ.
134 Pon-avara maram	*Cassia siamea*	Leguminosæ.
135 Poola maram	*Eriodendron anfractuosum*	Malvacæ.
136 Poovamkottai maram.	*Sapindus emarginatus*	Sapindaceæ.
137 Porasu maram	*Putea frondosa*	Leguminosæ.
138 Porasu maram	*Chloroxylon swietenia*	Rutaceæ.
139 Poompadiri maram	*Stereospermum chelonoides*	Bignoniaceæ.
140 Pulabendi maram	*Kydia calycina*	Malvaceæ.
141 Pulchi maram	*Schleichera trijuga*	Sapindaceæ.
142 Pulia maram	*Tamarindus indica*	Leguminosæ.
143 Punga maram	*Pongamia glabra*	Do.
144 Puvarasu maram	*Thespasia populnea*	Malvaceæ.
145 Rama-palam maram	*Anona reticulata*	Anonaceæ.
146 Sandana maram	*Santalum album*	Santalaceæ.
147 Sara-parappu maram.	*Buchanania latifolia*	Anacardiaceæ.
148 Sarai maram	*Acacia leucophloea*	Leguminosæ.
149 Seemaikothuvai maram.	*Pithecolobium saman*	Do.
150 Seetha-palam maram.	*Anona squamosa*	Anonaceæ.
151 Seram-kottai maram	*Semecarps anacardium*	Anacardiaceæ.
152 Sisoo maram	*Dalbergia sissoides*	Laguminosæ.
153 Sisoo maram	*Dalbargia sissoo*	Do.
154 Sombupattai maram	*Soymida febrifuga*	Meliaceæ.
155 Thadachi maram	*Crewia tiliaefolia*	Tillaceæ.
156 Thadasu maram	*Grewia tiliaefolia*	Do.
157 Thammattan maram	*Pittosporum floribundum*	Pittosporaceæ.
158 Thandri maram	*Terminalia belerica*	Combretaceæ.
159 Thani maram	*Terminalia belariva*	Do.
160 Thavasi maram	*Holoptelia integrifolia*	Ulmaceæ.

Botanical lists arranged alphabetically according to Tamil names—cont.

Serial number and Tamil name.	*Botanical name.*	*Natural order.*
	A. Trees—cont.	
161 Theku maram	*Tectona grandis*	Verbenaceæ.
162 Thethankottai maram	*Strychnes petatorum*	Loganiaceæ.
163 Thiruvachipu maram	*Thevetia neriifolia*	Apocynaceæ.
164 Thumbi maram	*Diospyros melanoxylon*	Ebenaceæ.
165 Thungumunji maram	*Entero lodium saman*	Leguminosæ.
166 Thuringi maram	*Albizzia amara*	Leguminosæ.
167 Udupai maram	*Pterospermum heyneanum*	Sterculiaceæ.
168 Vegatta maram	*Randia uliginosa*	Rubiaceæ.
169 Vakkanai maram	*Diospyros montana*	Ebenaceæ.
170 Vatanarayana maram	*Delonix elata*	Leguminosæ.
171 Vedadaram maram	*Dichrostachys cinerea*	Do.
172 Vedamkurunai maram	*Stereospermum Xylocarpum*	Bignoniaceæ.
173 Veduthalam maram	*Dichrostachys cinerea*	Leguminosæ.
174 Veerai maram	*Elaeodendron glaucum*	Celastraceæ.
175 Velangu maram	*Dalbergia lanceolata*	Leguminosæ.
176 Velthadai maram	*Givotia rottleriformis*	Euphorbiaceæ.
177 Velvelam maram	*Acacia leunophloea*	Leguminosæ.
178 Vengai maram	*Pterocarpus marsupium*	Do.
179 Ventheku maram	*Lager Stroemia lanceolata*	Lythraceæ.
180 Vepa maram	*Melia indica*	Meliaceæ.
181 Veppalai maram	*Wrightiatincotoria*	Apocynaceæ.
182 Vila maram	*Feronia elephantum*	Rutaceæ
183 Woddan maram	*Cleistanthus collinus*	Euphorbiaceæ.
184 Yelandai maram	*Zizyphus jujuba*	Rhammaceæ.
	B. Bamboos.	
185 Peruvarai moongil	*Bambusa arundinacea*	Gramineæ.
186 Siruvarai moongil	*Dendrocalamus strictus*	Do.
	C. Shrubs.	
187 Adathodai	*Adathodai vasica*	Acanthaceæ.
188 Aivanam	*Lawsonia inermiss*	Lythraceæ.
189 Anaisundakkai	*Solanum Verbascifolium*	Solanaceæ.
190 Avaram	*Cassia auriculata*	Laguminosæ.
191 Avarai	*Cassia auriculata*	Do.
192 Cherumkila	*Carissa carandas*	Apocynaceæ.
193 Chintharni	*Webera asiatica*	Rubiaceæ.
194 Chippa maram	*Rhus mysorensis*	Anacardiaceæ.
195 Cinni	*Acalypha fruticosa*	Euphorbiacesæ.
196 Eechampul	*Phoenix acaulis*	Palmæ.
197 Idamburi	*Helicters isora*	Sterculaceæ.
198 Kale	*Ximenia americana*	Oleaceæ.
199 Kandamkathari	*Solanum zanthocarpus*	Solanum.
200 Karai	*Ramdia dumetorum*	Rubiaceæ.
201 Karum-thulasi	*Ocimum sanctum*	Labiatæ.
202 Kathali	*Aloe vera*	Liliaceæ.
203 Kattanji	*Gymnesporia montana*	Gelastraceæ.
204 Kattanji	*Gymnosporia heyneana*	Do.
205 Kattu elimichi	*Atlantia monophylla*	Rutaceæ.
206 Kattu manjal	*Zingiber casumunar*	Zingiberaceæ.
207 Kattu molaga	*Toddalia aculeata*	Rutaceæ.
208 Kattu seekai	*Mimosa rubicaulis*	Leguminosæ.
209 Kattu Kathiri	*Capparis sepiaria*	Capperidaceæ.
210 Kattu Amanakku	*Jatropha curcas*	Euphorbiaceæ.
211 Kavali	*Tephrosia perpurea* (*Mundulea suberosa*)	Leguminosæ.
212 Kila	*Carissa carandas*	Apocynaceæ.
213 Kodivelam	*Acacia latronum*	Leguminosæ.
214 Kokki mullu	*Scutia indica*	Rhamnaceæ.
215 Kothu vela	*Flacourtia ramontchi*	Bixaceæ.
216 Kottai-yelandai	*Zizyphus glabrata*	Rhamnaceæ.
217 Kottai-manakku	*Croton lawianus*	Euphorbiaceæ
218 Kottu Veppulam	*Fluggea leucopyrus*	Do.
219 Kurungi	*Strobilanthoessp*	Acanthaceæ.
220 Karuvanji	*Ehretia buxifolia*	Boraginaceæ.
221 Kuve-koothi	*Allophylus serratus*	Sapindaceæ.
222 Madu-malati	*Hiptage madaolota*	Malpighiaceæ.
223 Marakalam	*Randia dumetoram*	Rubiacæ.
224 Marivalam	*Randia dumetorum*	Do.
225 Mola-carnai	*Toddalia asiatica*	Rutaceæ.
226 Molongarani	*Paramignya Monophylla*	Do.
227 Mullukalli	*Opuntia dillenii*	Cactaceæ.
228 Nagathali	*Opuntia dillenii*	Do.
229 Nana	*Clausena indica*	Rutaceæ.
230 Manari	*Hemidesmus indicus*	Asclepiadaceæ.
231 Narjuruvi	*Desmodium pulchellam*	Leguminosæ.
232 Nariyelandai	*Zizyhhus nummularia*	Rhamnaceæ.
233 Netti	*Aeschynomene aspera*	Leguminosæ.
234 Oomathu	*Datura stiamonium*	Solanaceæ.
235 Oosithagara	*Cassia tora*	Leguminosæ.
236 Pavattai	*Pavetta iandica*	Rubiaceæ.
237 Pavelum	*Nyetanthes arbortristis*	Oleaceæ.
238 Pon-avarai	*Cassis occidentale*	Leguminosæ.
239 Poola	*Iodigofera paucifolia*	Do.
240 Porivalan	*Toddalia aculeata*	Rutaceæ.
241 Sambal kiluvai	*Solanum giganteum*	Solanaceæ.
242 Savatu-chedi	*Cipadessa fruticosa*	Meliaceæ.
243 Sengarai	*Canthiumparviflorum*	Rubiaceæ.
244 Sigappu-poola	*Breynia rhamnoides*	Euphorbiaceæ.
245 Siru-sale	*Allophylus cobbe*	Sapindaceæ.

Botanical lists arranged alphabetically according to Tamil names—cont.

Serial number and Tamil name.	*Botanical name.*	*Natural order.*
	C. Shrubs—cont.	
246 Siru-inji	*Phoenix humilis*	Palmæ.
247 Siru-kila	*Carriea spinarum*	Apocynaceæ.
248 Soorai	*Zizyphus oenoplia*	Rhamnaceæ.
249 Sundakkai	*Solanum trilobatum*	Sulanaceæ.
250 Thagara	*Cassia tora*	Leguminosæ.
251 Thalai	*Pandanus tectorius*	Pandanaceæ.
252 Tharni	*Webera corymbosa*	Rubiaceæ.
253 Thirani	*Chomelia asiatica*	Do.
254 Thulasi	*Ocimum gratissium.*	Labiatæ.
255 Unni	*Lantana indica*	Verbenaceæ.
256 Valamburi	*Helecteres isora*	Sterculiaceæ.
257 Vel-oomathu ..	*Datura fastiosa*	Solanaceæ.
258 Vellari	*Dodonaea viscosa*	Sapindaceæ.
259 Vellai poola	*Fluggea microcarpa*	Eupherbeaceæ.
260 Vellilambu	*Hemicyclia sepiaria*	Do.
261 Virai	*Hemicyclia sepiaria*	Do.
262 Yerukku	*Calotrophis gigantea*	Asclepiadaceæ.
	D. Climbers.	
263 Gajjikai	*Cæsalpinia bonducella*	Leguminosæ.
264 Indu-mullu, Seengaikodi.	*Acacia intsia*	Do.
265 Kalachikai	*Cæsalpinia bonducella*	Do.
266 Kakattan	*Argyreia speciosa*	Convolvulaceæ.
267 Kakkavali	*Mucana gigantea*	Leguminosæ.
268 Kari karan	*Acacia cæsia*	Do.
269 Kari indi	*Pterolobium indicum*	Do.
270 Kattu-avaraikodi ..	*Spatholobus roxburghii*	Do.
271 Katukodimundari ..	*Ampelocissus latifolia*	Ampelideæ.
272 Kattumandarai ..	*Bauhinia vahlii*	Leguminosæ.
273 Kattu malligai ..	*Jasminum arborescens*	Oleaceæ.
274 Kattu-valai	*Jvaria narum*	Anonaceæ.
275 Kattu-velli	*Dioscorea pentaphylla*	Dioscoreaceæ.
276 Kavalkodi	*Dioscorea hispida*	Do.
277 Kodi veerai	*Hugonia mystax*	Lineæ.
278 Konnoou	*Glorious superba*	Libiaceæ.
279 Kottukodi	*Cocculus villesus*	Menispermaceæ.
280 Kundumani	*Abrus precatorius*	Leguminosæ.
281 Naruvalankodi ..	*Narvelia zeylanica*	Ranunculaceæ.
282 Onankodi	*Lettsomia elliptica*	Conveluculaeeæ.
283 Oothalkodi	*Ichnocarpus frutescens*	Apoeynaceæ.
284 Perandai	*Cissus quadrangularis*	Ampelideæ.
285 Punali	*Derris scandens*	Leguminosæ.
286 Puli-thadaki ..	*Pterolobium indicum*	Do.
287 Seekayi	*Acacia concinna*	Do.
288 Seendalkodi ..	*Pergularia extensa*	Asclepiadaceæ.
289 Seeraikodi	*Secamone emetica*	Do.
290 Sirupalakodi ..	*Gymneme sylvestre*	Do.
291 Sural	*Ventilago calyculata*	Rhamnaceæ.
292 Thannuta kodi ..	*Asparagus racemosus*	Liliaceæ.
293 Vennangu kodi ..	*Combretum ovalifolium*	Combretaceæ.
294 Vellaikundumani ..	*Abrus pulchellus*	Laguminosæ.
295 Vellandu	*Acacia caehia*	Do.
296 Vembalam	*Ventilago calyculata*	Rhamnaceæ.
297 Vembalam	*Ventilago madraspatna*	Do.

APPENDIX VI-C.

(*Reference*—Paragraph 89, Part I.)

The spike disease of sandal.—A large amount of research work has been done on the spike disease of sandal, which has resulted in vast quantity of literature.

Spike disease of sandal is a disease which kills the tree it attacks. The first official reference to the disease is to be found in the "Report on Forest Administration in Coorg for 1898–99." It was for the first time described in December 1899 by Mr. McCarthy, Deputy Conservator of Forests in a memorandum submitted to the Coorg Government. The disease must have made its appearance in Coorg or Mysore (probably the latter) several years before McCarthy observed it.

The earliest official reference to the havoc caused by the disease occurs in the Administration Report of 1904–05 by which date presumably the disease had become known in the Presidency of Madras.

External manifestation of the disease.—" The new shoots and leaves of a tree (spiked) instead of presenting the graceful appearance natural to the species, begin to grow stiff and erect like bristles, and as their arrangement in opposite and alternate the shoot looks like a spike with four lines of erect leaves growing down it, something like a chimney brush. There is no discernible change in the new axis except that it grows out stiff and straight. As regards the leaves, in the first place the distance between the alternate pair is greatly decreased, then the petiole and blade are tip to tip in one straight line and lastly the blade is shorter, narrower and more pointed. As the disease progresses, the new leaves become still smaller, narrower, and more pointed and fewer each successive year, until the new shoots present the appearance of fine spikes bearing four rows of bristles. After this, the tree rapidly dies."

The name " spike " was given to the disease by McCarthy on account of the resemblance of diseased shoots to a spike.

The external manifestation of the disease may be briefly summarized as follows :—

(i) The size of the leaf is progressively reduced with the advance of the disease and the internodes are shortened, thus producing a resemblance to Witche's brooms.

(ii) Spiked branches bear no flowers or fruit except occasionally in early stage and exhibit the phenomenon of phyllody (transformation of normal sepals and petals in the inflorescence into small foliage leaves).

(iii) An increase in the period of vegetative growth is shown by the diseased plants.

(iv) The colour of the spiked leaves is pale bluish green, which often changes to a reddish colour.

(v) In an advanced stage of the disease the haustoria and fine root ends of the tree are dead.

(vi) Although spike may initially attack only one branch of a tree, all branches which later become attached, exhibit symptoms in the same stage of advance of the disease as the original branch.

Effects of spike.—A tree which has shown the external symptoms of spike invariably dies. No properly authenticated case of a diseased tree having recovered from the disease is yet known, although stray cases of recovery have occasionally been reported. Up to the present no attempt at curing a tree which has manifested the disease has been successful. Also, our present knowledge of the time taken by the disease to kill a tree after the first symptoms have appeared is scanty. We know, however, that this period is very variable, depending on probably the virulence of the attack, the health and age of the tree. It may be assumed that an attacked tree rarely survives beyond two years.

Immunity (local and individual).—Several instances of extensive and well defined blocks of sandal forest which have remained uninvaded by spike are known. The immunity or resistance of such areas (in several cases with centres of infection close by) cannot be due merely to accident. It is believed that host trees of certain species can immunize sandal parasitic on them. It is possible that the under-growth may have something to do with the incidence of the disease either by initially attracting the insect sectors or by providing alternative hosts for them. Individual trees standing in spiked areas are often found to have been unaccountably spared by the disease. The immunity of such trees is probably to be ascribed to their possession of some principle of resistance to the disease.

Pre-disposing factors.—It may be supposed that anything which adversely affect the general health and well being of a sandal tree will pre-dispose it to spike. Such pre-disposing factors may be (1) fire, (2) wounds, (3) lopping of branches, (4) browsing by deer, sambhur and cattle and (5) bark scorching. On general grounds it is safe to assume that anything which impairs the health and vitality of a sandal tree or disturbs its metabolic equilibrium must increase its proneness to disease. By the contrary, trees in a robust state of health with ample green foliage should be able to resist the disease.

APPENDIX VII.

Statement of grazing incidence—Period 1934–35 *to* 1945–46

Year.	Vellore Range.		Odugathur Range.		Santavasal Range.		Polur Range.		Tiruvannamalai Renge.		Division.		Remarks.
	Area open to grazing.	Number of cattle grazed.	Area open to grazing.	Number of cattle grazed.	Area open to grazing.	Number of cattle grazed.	Area open to grazing.	Number of cattle grazed.	Area open to grazing.	Number of cattle grazed.	Area open to grazing.	Number of cattle grazed.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	ACS.	COW UNITS.	ACS.	COW UNITS.	ACS.	COW UNITS.	ACS.	COW UNITS.	ACS.	COW UNITS.	ACS.	COW UNITS.	
1934–35	..	..	99,079·49	20,272	68,532·20	8,288	69,948·25	7,362	49,462·42	14,516	287,022·36	50,438	Figures are available for Vellore and Odugathur Ranges separately from 1936–37 only.
1935–36	..	..	99,140·49	21,350	68,443·20	8,814	70,012·25	7,272	52,089·42	14,926	289,685·36	52,362	
1936–37	35,566·12	5,614	66,861·97	15,594	64,361·20	8,800	70,192·25	7,294	51,983·42	15,564	288,964·96	52,866	
1937–38	34,311·29	7,574	67,216·97	16,160	64,279·20	7,600	69,894·01	7,668	44,506·69	16,260	280,206·16	55,262	
1938–39	35,128·89	8,896	67,375·07	19,844	65,330·20	9,180	70,632·25	9,700	52,113·42	18,704	290,579·83	66,324	
1939–40	34,869·29	8,800	67,711·76	20,264	65,371·20	11,440	70,589·19	11,239	52,096·42	17,820	290,637·86	69,563	
1940–41	35,217·29	8,092	67,587·76	19,960	65,275·20	9,608	70,597·19	14,036	52,158·42	19,572	290,835·86	71,268	
1941–42	35,334·29	9,549	67,834·97	18,340	65,302·11	17,720	69,993·01	17,563	52,143·44	14,009	290,607·82	77,181	
1942–43	37,137·29	10,031	67,565·97	18,233	65,017·20	17,365	69,773·01	17,334	51,774·44	13,999	291,265·91	76,962	
1943–44	35,783·79	6,510	67,285·96	12,234	58,614·80	26,657	70,034·01	22,375	51,681·44	9,399	283,400·00	77,175	
1944–45	35,391·79	8,427	66,315·77	15,790	65,320·20	15,552	68,256·01	26,251	51,542·44	12,272	286,827·21	78,292	
1945–46	34,913·79	11,262	64,346·95	20,757	64,318·70	20,909	75,693·41	24,417	50,965·44	16,440	290,738·29	93,785	
Total ..	353,653·88	84,755	868,323·13	218,798	780,666·41	161,933	845,614·84	172,511	612,515·41	183,481	3,460,773·62	821,478	
Average ..	35,365·3	8,476	72,360·2	18,238	655055·5	13,494·4	70,467·9	14,376	51,043	15,290	288,397·80	68,457	
Incidence ..	4·1	..	3·9	..	4·8	..	4·8	..	3·4	..	4·2		

APPENDIX VIII.

FORM VIII.

Control of fellings in the Sandal Working Circle.

Felling Series.

Enclosures of the Range.

Prescribed.—Extraction of dead trees, including all stumps and roots and green fallen or broken stems and branches (Working Plan paragraph 256) once in six years in each coupe of nine felling series (Working Plan paragraph 259) annually in 57 enclosures and biennially in 30 enclosures (Working Plan paragraph 260).

Prescribed.			*Done.*	
Year.	*Area.*	*Coupe number. Number of enclosures.*	*Year(s) of actual working.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)

NOTE.—A separate form will be used for each felling series or the enclosures of each range.

FORM VIII (*a*).

Record of yield from the Sandal Working Circle.

Estimated outturn.—Forty-eight tons annually (Working Plan paragraph 253).

Year.	*Locality worked.*			*Outturn.*	*Remarks.*
	Felling series or enclosures.	*Coupe number or number of enclosures.*	*Area.*		
(1)	(2)	(3)	(4)	(5)	(6)
			ACS.	TONS. CWT. QR. LB.	

FORM IX.

Felling Series Journal for the Sandal Working Circle.

Felling Series.

Enclosures in the Range.

Year.	*Coupe number.*	*Number of trees extracted in each girth class.*				*Rough-wood outturn from each girth class.*	
		Girth class.	*Heart wood.*	*Sapwood.*	*Percentage of sapwood to total number.*	*Total.* LB.	*Average per heartwood tree.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

NOTE.—(i) When enclosures are being dealt with, column (2) will be left blank.

(ii) A separate form will be used for each felling series or for the enclosures in each range.

FORM IX (*a*).

Sandal Propagation Control Journal.

Year.	*Name of range.*	*Locality.*	*Propagation centre.*			*Origin of seed or stumps.*	*Quantity of seeds sown or number of stumps planted.*	*Name of host species in the plot.*	*Date of sowing or stump planting.*	*Date of first germination or first sprouting of leaves.*	*Replacement of casualties.*		*Survivals at the end of the first year.*			*Remarks.*
			Serial number.	*Size.*	*How formed.*						*Date.*	*Number of seedlings or stumps.*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)

FORM XI.

Control of fellings in the Fuel and Small Timber Working Circle.

Regular / Reserve felling series.

Prescribed.—One coupe in each felling series to be worked each year, should there be a demand (Working Plan paragraph 299).

Prescribed.		*Done.*			
Year.	*Average area of coupes.*	*Coupe number.*	*Year of working.*	*Area worked.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)
	ACS.			ACS.	

NOTE.—A separate form will be used for each felling series.

FORM XI (*a*).

Record of yield from the Fuel and Small Timber Working Circle.

Regular / Reserve felling series.

Estimated outturn tons of firewood per acre.
cubic feet of small timber per acre.

Year.	*Locality worked.*		*Outturn.*		*Remarks.*
	Coupe number.	*Area.*	*Kind.*	*Quantity.*	
(1)	(2)	(3)	(4)		(5)
		ACS.			

NOTE.—A separate form will be used for each felling series.

FORM XII.

Control of concentrated Kumri regeneration.

Range.
Reserve.
Name of felling series.
Year of regeneration.
Name of Kumridars.
Name of field crops sown and date of sowing.
Date of harvesting of field crops.
Date of evacuation by Kumridar.

Number of coupe regenerated.
Area regenerated.
Number of plant lines.

Name of operations.	*Date of operations.*	*Species sown or planted.*	*Survivals at the beginning of the second growing season.*		*Survivals at the beginning of the third growing season.*		*Remarks.*
			In all plant lines.	*Average per plant line.*	*In all plant lines.*	*Average per plant line.*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

FORM XII (*a*).

Control of Palar Plantation Fuel Felling Series.

Range.
Reserve.
Name of felling series.
Year of regeneration.

Number of coupe regenerated.
Area regenerated.
Number of plant lines.

Nature of operations.	*Date of operations.*	*Total cost.*	*Rate of cooly wages.*	*Species sown or planted.*	*Survivals at the beginning of the second growing season.*		*Survivals at the beginning of the third sowing season.*		*Remarks.*
					In all plant lines.	*Average per plant line.*	*In all plant lines.*	*Average per plant line.*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

FORM XIII.

Control of fellings in the Bamboo Working Circle.

Felling Series.

Prescribed.	Done.			Remarks.
	Coupe number.	Area.	Year(s) of actual working.	
(1)	(2)	(3) ACS.	(4)	(5)

NOTE.—A separate form will be used for each felling series.

FORM XIII (*a*).

Record of yield for the Bamboo Working Circle.

Felling series.

Estimated outturn—None estimated.

Year.	Locality worked.		Outturn.		Remarks.
	Coupe number.	Area,	Kind.	Quantity.	
(1)	(2)	(3) ACS.		(4)	(5)

NOTE.—(i) Denominations, i.e., cart-loads, head-loads, or culms should be clearly recorded.
(ii) A separate form will be used for each felling series.

FORM XIV.

Control of working in the Minor Forest Produce Working Circle.

Prescribed.		Done.	
Produce and details of working.	Sale unit.	Year(s) of actual working.	Remarks.
(1)	(2)	(3)	(4)

FORM XIV (*a*).

Record of yield for the Minor Forest Produce Working Circle.

Yield (for botanical names see paragraph 101).

		Per maund of 25 lb.									Per measure.								Cart-load.			Lb.		
Year.	Range.	Konnai bark.	Avaram bark.	Sural bark.	Nuxvomica.	Tettankottai.	Tamarind.	Gall nuts.	Soap nuts.	Pungam.	Kamalapodi.	Tagari.	Serankottai.	Kattamanakku.	Nellikkoi.	Sarapappu.	Elandai.	Kalakkai.	Woodapple.	Kavadi grass.	Quarry stones.	Honey.	Bees wax.	Horn.

FORM XV (*a*).

Record of yield for the Green Leaf Manure Working Circle.

Prescribed.—Permits will be issued at Re. 0–12–0 per cart-load for removals from the Vellore and Odagathur ranges and at Re. 1 per cart-load from the Santavasal, Polur, and Tiruvannamalai ranges (Working Plan paragraph 389).

Year.	Range.	Quantity removed, cart-loads.	Remarks.
(1)	(2)	(3)	(4)

FORM XVI.

GR ZING WORKING CIRCLE.

Control of grazing.

Year.	*Prescriptions.*		*Done.*		Remarks.
	Closed areas.	*Grazing concessions.*	*Areas actually closed acres.*	*Concessions continued.*	
(1)	(2)	(3)	(4)	(5)	(6)

Record of works.

Year .

Working Circle.

Prescriptions of working plan.		*Record of operations carried out.*				*Remarks.*
Nature of work (with Working Plan paragraph reference numbers).	*Locality.*	*Nature of work.*	*Locality.*	*Area.*	*Cost.*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
				ACS.	RS.	

NOTES.—(i) The areas in column (5) should be extracted from columns (3), (5), (7), etc., of the statement in paragraph 259.

(ii) Cost in column (6) will be recorded to the nearest rupee.

Control Journal.

(To be written on durable paper and maintained in a loose leaf file.)

The following headings are suggested as a guide :—

Sandal Working Circle .. ..
1 Reference to important deviations, if necessary in amplification of entries in the Register of Deviations.
2 Criticism of prescriptions and suggestions for improvement.
3 Exploitation notes and rates.
4 Tending.
5 Artificial regeneration.
6 Spike.
7 Markets and market conditions.

Fuel and Small Timber Working Circle.
1 Reference to important deviations, if necessary in amplification of entries in the Register of Deviations.
2 Criticism of prescriptions and suggestions for improvement.
3 Size of coupes.
4 Cutting thorny growth at time of felling.
5 Artificial regeneration :
(i) Palar plantations.
(ii) Concentrated Kumri regeneration (date of burning and sowing, choice of species, tending, Soil aeration, etc.).
6 Markets and market conditions.

Bamboo Working Circle ..
1 Reference to important deviations, if necessary in amplification of entries in the Register of Deviations.
2 Criticism of prescriptions and suggestions for improvement.
3 Flowering.
4 Injuries, e.g., lopping for fodder.
5 Felling rules-extent to which observed.
6 Markets and market conditions.

Minor Forest Produce Working Circle.
1 Reference to important deviations, if necessary in amplification of entries in the Register of Deviations.
2 Criticism of prescriptions and suggestions for improvement.
3 Departmental working, if undertaken, with reasons for the departure from the usual system of leases.
4 Markets and market conditions.

Green leaf Manure Working Circle.	1 Reference to important deviations, if necessary in amplification of entries in the Register of Deviations. 2 Criticism of prescriptions and suggestions for improvement. 3 Rules regulating cutting and removal.
Grazing Working Circle ..	1 Reference to important deviations, if necessary in amplification of entries in the Register of Deviations. 2 Criticism of prescriptions and suggestions for improvement. 3 Exercise of concessions and withdrawals, if any. 4 Closure of burnt areas. 5 Watering facilities. 6 Grass cutting and fodder supply.
Miscellaneous	1 General protection. 2 Experiments. 3 Roads. 4 Buildings. 5 Wells. 6 Lantana. 7 Boundaries. 8 Fire protection.
Establishment and labour ..	1 Establishment—Any change which may be found necessary. 2 Labour—Sufficiency or otherwise, wages, etc.
Financial results	To facilitate comparison with working plan forecasts, the financial results will be recorded in the following form. Separate forms will be used for expenditure and revenue and each working circle will be dealt with separately, though not necessarily on a separate form.

Expenditure 19 -19 .

Revenue.				
Forecast.	RS.	*Actuals.*	RS.	*Remarks.*
(1)	(2)	(3)	(4)	(5)

Sandal Working Circle.

Fuel and Small Timber Working Circle.

The entries in this form will not be so detailed as those in the financial forecast ; they will not show interest charges for overheads such as share of " direction," and amounts will be rounded off to the nearest rupee. The columns will be written up by the District Forest Officer. Brief reasons for notable variations should be given in column (5).

Deviation statement.

Workig Plan for the Vellore East Division.

Year

Serial number of deviation.	*Control form number and page.*	*Reference to Working Plan.*		*Nature of deviation.*	*Remarks.*
		Paragraph.	*Prescription.*		
(1)	(2)	(3)	(4)	(5)	(6)

Proceedings of the Chief Conservator of Forests

Proceedings Mis. No. 69, 5th February 1953

Working Plan—Vellore East Forest Division—Sanctioned.

SRI M. KESAVAN UNNI NAYAR, I.F.S.,
Chief Conservator of Forests.

Proceedings—Mis. No. 69, dated 5th February 1953.

Sanctioned.

M. KESAVAN UNNI NAYAR,
Chief Conservator of Forests.

(True copy)

Personal Assistant.

To the Conservator of Forests, Working Plans Circle.
" Conservator of Forests, Salem Circle.
" District Forest Officer, Vellore East.

Reg. No. 3017 HE 49-65

Printed at the Survey of India offices (H.L.O.)